CMA-D7/D7CE

SERVICE MANUAL

CAMERA ADAPTOR

SONY®

[For CMA-D7]

SAFETY CHECK-OUT

After correcting the original service problem, perform the following safety checks before releasing the set to the customer:

Check the metal trim, "metallized" knobs, screws, and all other exposed metal parts for AC leakage. Check leakage as described below.

LEAKAGE TEST

The AC leakage from any exposed metal part to earth ground and from all exposed metal parts to any exposed metal part having a return to chassis, must not exceed 0.5 mA (500 microampers). Leakage current can be measured by any one of three methods.

1. A commercial leakage tester, such as the Simpson 229 or RCA WT-540A. Follow the manufacturers' instructions to use these instruments.
2. A battery-operated AC milliammeter. The Data Precision 245 digital multimeter is suitable for this job.
3. Measuring the voltage drop across a resistor by means of a VOM or battery-operated AC voltmeter. The "limit" indication is 0.75 V, so analog meters must have an accurate low-voltage scale. The Simpson 250 and Sanwa SH-63Trd are examples of a passive VOM that is suitable. Nearly all battery operated digital multimeters that have a 2 V AC range are suitable. (See Fig. A)

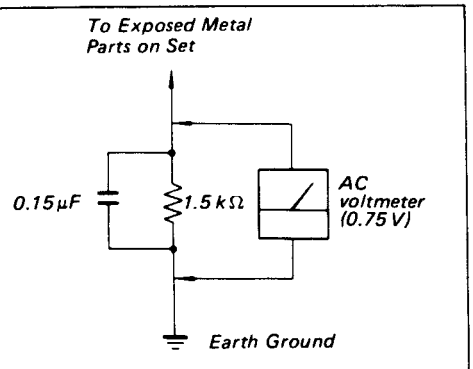

Fig. A. Using an AC voltmeter to check AC leakage.

[For CMA-D7CE]

CAUTION

A CERTIFIED PLUG RATED 250 V, 6A OR MORE FOR CLASS I EQUIPMENT MUST BE ATTACHED TO THE END OF THE POWER CORD.

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1. OPERATION OF CMA-D7CE

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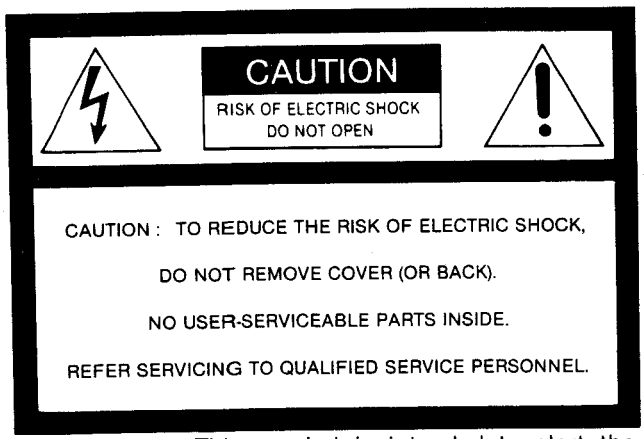
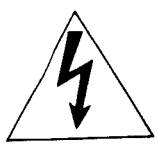
CHAPTER 1
OPERATION OF CMA-D7

WARNING

To prevent fire or shock hazard, do not expose the unit to rain or moisture.


CAUTION
RISK OF ELECTRIC SHOCK
DO NOT OPEN
CAUTION : TO REDUCE THE RISK OF ELECTRIC SHOCK,
DO NOT REMOVE COVER (OR BACK).
NO USER-SERVICEABLE PARTS INSIDE.
REFER SERVICING TO QUALIFIED SERVICE PERSONNEL.



This symbol is intended to alert the user to the presence of uninsulated "dangerous voltage" within the product's enclosure that may be of sufficient magnitude to constitute a risk of electric shock to persons.

This symbol is intended to alert the user to the presence of important operating and maintenance (servicing) instructions in the literature accompanying the appliance.

*The graphical symbols are on the bottom enclosure.

1-1. FEATURES

The CMA-D7 is a camera adaptor designed for use with the Sony AVC-D7 or SSC-D7 CCD video camera.

- The power and the sync signal can be supplied to the camera and the video signal can be received from the camera through a coaxial cable.
- The cable compensation circuitry compensates for the degradation of the video signal caused by camera cable extension up to 300 m.
- Supplied with two VIDEO OUT connectors, this unit can be connected to two video monitors.

1-2. PRECAUTIONS

Safety

- Before operating the unit, check that the operating voltage of the unit is identical with the voltage of your local power supply.
- Should any material, liquid or solid, fall into the cabinet, unplug the unit and have it checked by qualified personnel before operating it further.
- Unplug the unit from the wall outlet when it is not to be used for an extended period of time.
- To disconnect the cord, pull it out by the plug. Never pull it by the cord.

Installation

- Allow adequate air circulation to prevent internal heat build-up.
- Do not install the unit near heat sources such as radiators or air ducts or in a place subject to direct sunlight.

Cleaning

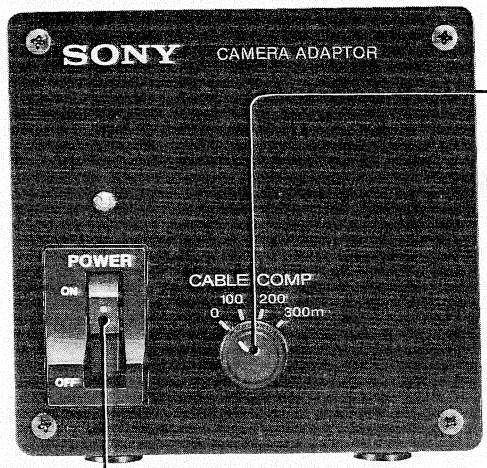
Clean the cabinet, panel and controls with a dry soft cloth or a soft cloth lightly moistened with a mild detergent solution. Do not clean the unit with any type of solvent, such as alcohol or benzine, since this may damage the finish.

Repacking

Do not discard the carton. It affords maximum protection whenever the unit is transported.

1-3. LOCATION AND FUNCTION OF PARTS

Front panel



CABLE COMP (compensation) selector
When a camera is connected to the ⎓ DC OUT/VIDEO IN connector, the degradation in the frequency response and in the output level caused by the camera cable extension can be compensated for by setting this selector according to the cable length, as follows:

Cable length (m) (Using RG-6A/U)	Selector position
Less than 100	0
About 100	100
About 200	200
About 300	300

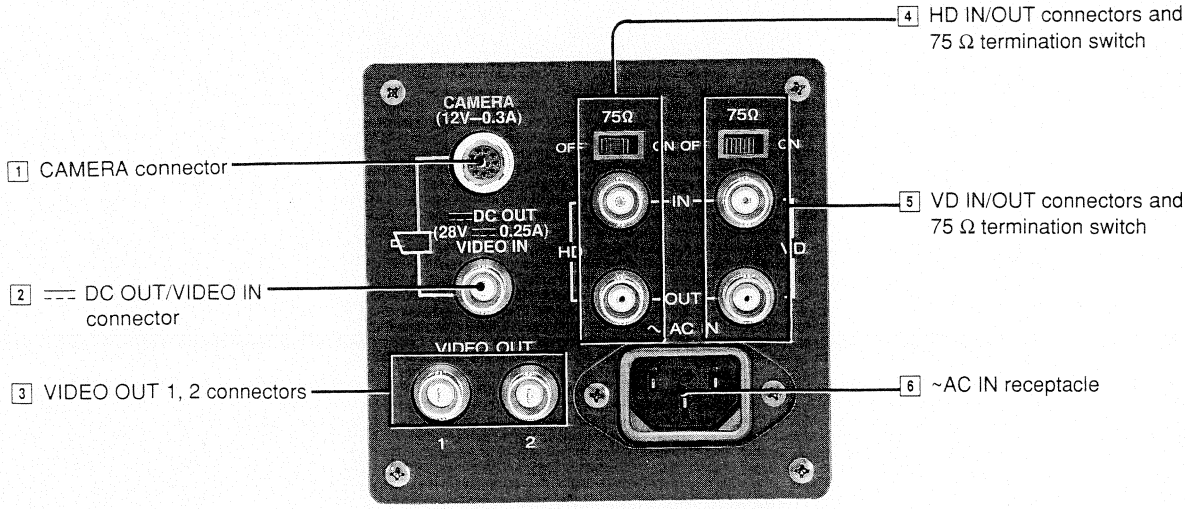
When the camera is connected to the CAMERA connector using the CCMC cable, set this selector to "0".

The compensable cable length varies depending on the type of coaxial cable used. See the following list.

Coaxial cable	Length
RG-59B/U	100 m
RG-6A/U	300 m
RG-11A/U	500 m

POWER switch and indicator
Press the ON side of this switch to turn on to supply power to the unit. The indicator will light up.

Rear panel



[1] **CAMERA connector** (12-pin)
Used to connect a camera with a CCMC 12-pin cable.
The power and the sync signal are supplied to the camera and the video signal is transmitted from the camera.
This connector and the ⎓ DC OUT/VIDEO IN connector [2] cannot be used simultaneously.

[2] ⎓ **DC OUT (DC power output)/VIDEO IN (video input) connector** (BNC type)
Used to connect a camera with a coaxial cable.
DC power is supplied to the camera, and the video signal is transmitted from the camera. When connecting a camera which can add the sync signals to the DC power voltage (AVC-D7), the sync signal can be transmitted to the camera through this connector.
This connector and the CAMERA connector [1] cannot be used simultaneously.

[3] **VIDEO OUT (video output) 1,2 connector (BNC type)**
The video signal supplied from the camera is output from this connector.

[4] **HD IN/OUT (HD signal input/output) connectors (BNC type) and 75 Ω termination switch**
Used to input/output the HD signal.
IN (input) connector
Used to input the HD signal.
The input HD signal is transmitted to the camera through the CAMERA connector [1].
OUT (output) connector
The signal supplied to the IN connector is directly fed out from this connector.
75 Ω termination switch
When only the IN connector is used, set this switch to ON.
When both the IN and OUT connectors are used, set it to OFF.

[5] **VD IN/OUT (VD signal input/output) connectors (BNC type) and 75 Ω termination switch**
Used for VBS, VS, SYNC or VD signal connection.
IN (input) connector
Used to input the VBS, VS, SYNC or VD signal.
The input signal is transmitted to the camera through the CAMERA connector or the ⎓ DC OUT/VIDEO IN connector.
OUT (output) connector
The signal supplied to the IN connector is directly fed out from this connector.
75 Ω termination switch
When only the IN connector is used, set this switch to ON.
When both the IN and OUT connectors are used, set it to OFF.

[6] ~ **AC IN receptacle**
Used to connect an AC outlet by using the supplied AC power cord.

1-4. CONNECTION EXAMPLES

1-4-1. Supplying Power to the AVC-D7

Only one camera can be connected to the CMA-D7.

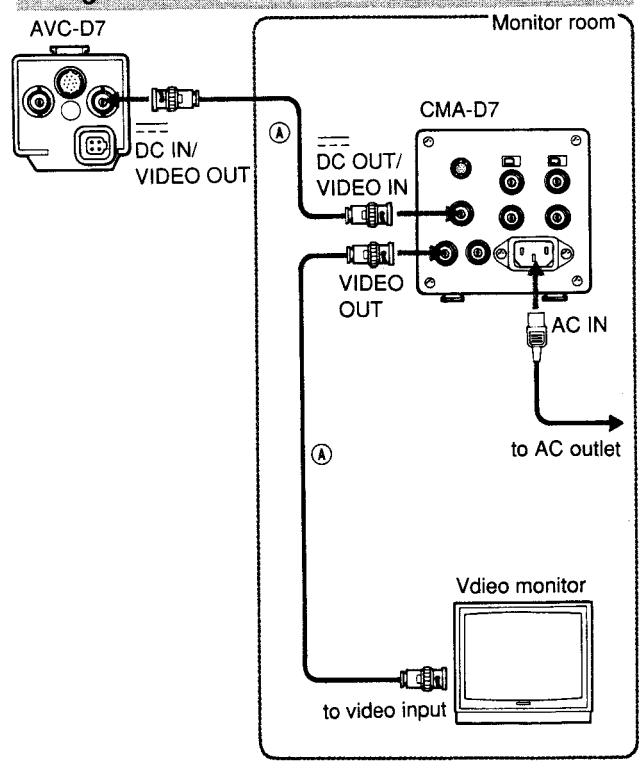
There are two ways to supply the power from this unit to the AVC-D7 CCD video camera.
- Using a 75-ohm coaxial cable between the ⎓ DC IN/VIDEO OUT connector of the AVC-D7 and the ⎓ DC OUT/VIDEO IN connector of the CMA-D7
- Using a CCMC 12-pin cable between the ⎓ DC IN 11-16 V 3.3 W connector of the AVC-D7 and the CAMERA connector of the CMA-D7

Make only one of the above connections. If both power connections are made at the same time, the camera will not output the video signal properly.

Note

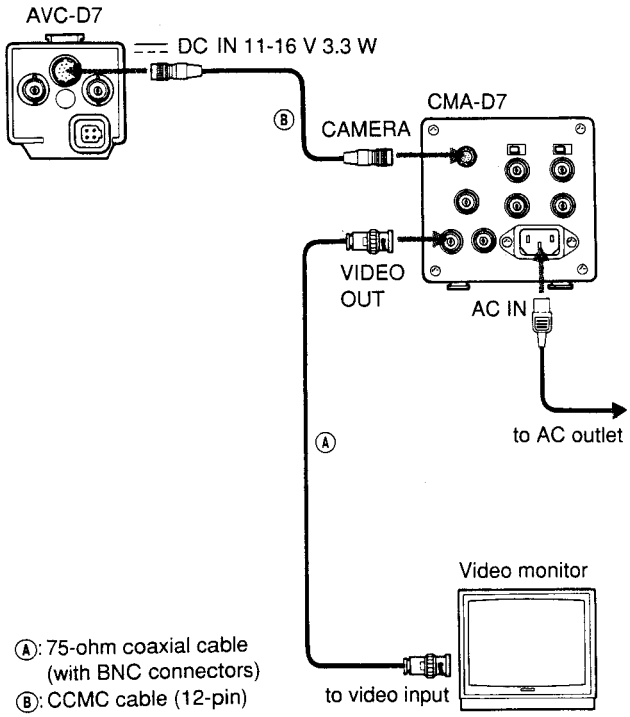
If the unit is turned on before connections are made, this unit may be deactivated by the breaker. In this case, turn the unit off and connect the camera correctly. And after that, turn the unit on again.

Using the ⎓ DC OUT/VIDEO IN connector



Ⓐ: 75-ohm coaxial cable (with BNC connectors)

Using the CAMERA connector

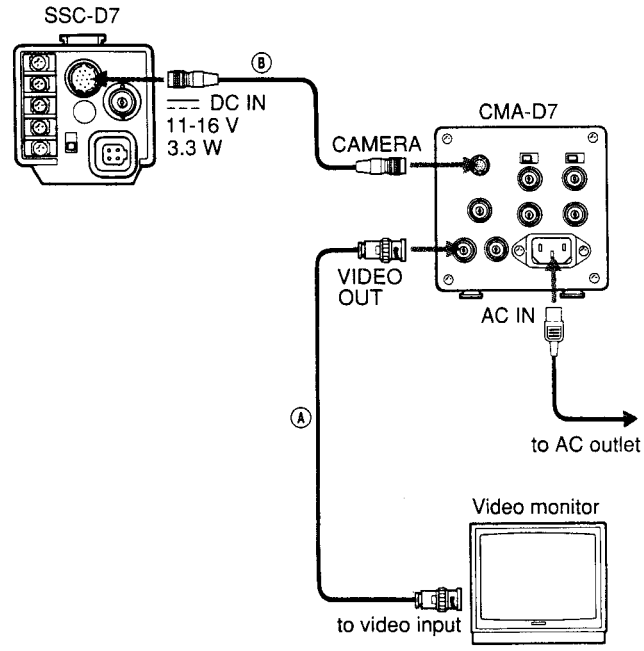


Ⓐ: 75-ohm coaxial cable (with BNC connectors)
Ⓑ: CCMC cable (12-pin)

1-4-2. Supplying Power to the SSC-D7

Note

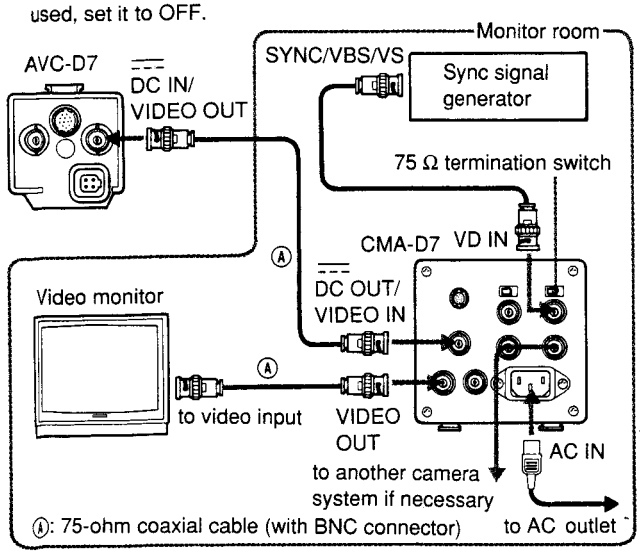
- When the power is supplied through the CAMERA connector, the ~AC 24 V IN terminals cannot be used.



Ⓐ: 75-ohm coaxial cable (with BNC connectors)
Ⓑ: CCMC cable (12-pin)

Supplying power and the sync signal and transmitting the video signal to the AVC-D7

- When this unit is used with the AVC-D7 CCD video camera, the sync signals can be added to the power supplied through this unit. For the switch setting of the AVC-D7, refer to the operating instruction manual of the AVC-D7.
- When only the VD IN connector is used, set the 75 Ω termination switch to ON. When both the VD IN and OUT connectors are used, set it to OFF.



1-5. SPECIFICATIONS

Power requirements
120 V AC, 60 Hz

Power consumption
30 W

Inputs and outputs
VIDEO OUT: BNC type
Video 0.7 Vp-p, Sync 0.3 Vp-p,
75 ohms, unbalanced, sync negative
⎓ VIDEO IN/DC OUT: BNC type
28 V DC, 0.25 A
Video 0.7 Vp-p, Sync 0.3 Vp-p,
75 ohms, unbalanced, sync negative
CAMERA: 12-pin multi
12 V DC, 0.3 A
HD IN/OUT: BNC type
Loop-through, with 75 Ω termination switch
VD IN/OUT: BNC type
Loop-through, with 75 Ω termination switch

Operating temperature
0°C to +40°C (32°F to 104°F)

Storage temperature
−20°C to +60°C (−4°F to +140°F)

Dimensions
Approx. 105 × 100 × 230 mm (w/h/d)
(4 1/4 × 4 × 9 1/8 inches)

Weight
Approx. 2.7 kg (5 lb 13 oz)

Supplied accessories
AC power cord (1)
Operation manual (1)

Design and specifications are subject to change without notice.

CHAPTER 1
OPERATION OF CMA-D7CE

WARNING

To avoid electrical shock, do not open the cabinet. Refer servicing to qualified personnel only.

WARNING
THIS APPARATUS MUST BE EARTHED

IMPORTANT
The wires in this mains lead are coloured in accordance with the following code:

Green-and-yellow	:	Earth
Blue	:	Neutral
Brown	:	Live

As the colours of the wires in the mains lead of this apparatus may not correspond with the coloured markings identifying the terminals in your plug proceed as follows:
The wire which is coloured green-and-yellow must be connected to the terminal in the plug which is marked by the letter E or by the safety earth symbol ⏚ or coloured green or green-and-yellow. The wire which is coloured blue must be connected to the terminal which is marked with the letter N or coloured black. The wire which is coloured brown must be connected to the terminal which is marked with the letter L or coloured red.

1-1. FEATURES

The CMA-D7CE is a camera adaptor designed for use with the Sony AVC-D7CE CCD video camera.
- The power and the sync signal can be supplied to the camera and the video signal can be received from the camera through a coaxial cable.
- The cable compensation circuitry compensates for the degradation of the video signal caused by camera cable extension up to 300 m.
- Supplied with two VIDEO OUT connectors, this unit can be connected to two video monitors.

1-2. PRECAUTIONS

Safety
- Before operating the unit, check that the operating voltage of the unit is identical with the voltage of your local power supply.
- Should any material, liquid or solid, fall into the cabinet, unplug the unit and have it checked by qualified personnel before operating it further.
- Unplug the unit from the wall outlet when it is not to be used for an extended period of time.
- To disconnect the cord, pull it out by the plug. Never pull it by the cord.

Installation
- Allow adequate air circulation to prevent internal heat build-up.
- Do not install the unit near heat sources such as radiators or air ducts or in a place subject to direct sunlight.

Cleaning
Clean the cabinet, panel and controls with a dry soft cloth or a soft cloth lightly moistened with a mild detergent solution. Do not clean the unit with any type of solvent, such as alcohol or benzine, since this may damage the finish.

Repacking
Do not discard the carton. It affords maximum protection whenever the unit is transported.

1-3. LOCATION AND FUNCTION OF PARTS

Front panel

CABLE COMP (compensation) selector
When a camera is connected to the ⎓ DC OUT/VIDEO IN connector, the degradation in the frequency response and in the output level caused by the camera cable extension can be compensated for by setting this selector according to the cable length, as follows:

Cable length (m) (Using RG-6A/U)	Selector position
Less than 100	0
About 100	100
About 200	200
About 300	300

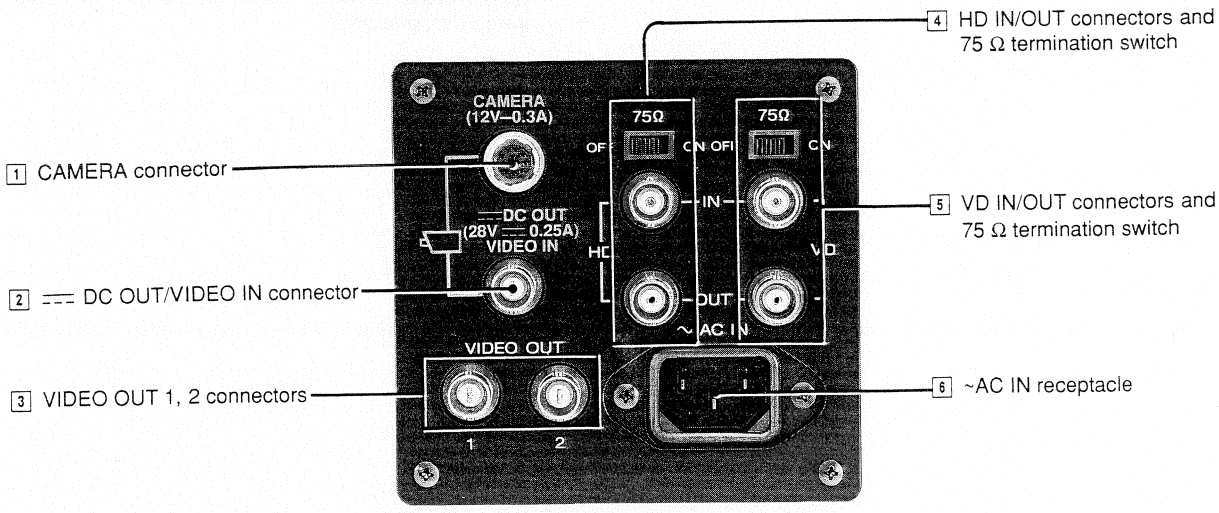
When the camera is connected to the CAMERA connector using the CCMC cable, set this selector to "0".

The compensable cable length varies depending on the type of coaxial cable used. See the following list.

Coaxial cable	Length
RG-59B/U	100 m
RG-6A/U	300 m
RG-11A/U	500 m

POWER switch and indicator
Press the ON side of this switch to turn on to supply power to the unit. The indicator will light up.

Rear panel



[1] **CAMERA connector** (12-pin)
Used to connect to a camera using a CCMC 12-pin cable.
The power and the sync signal are supplied to the camera and the video signal is transmitted from the camera.
This connector and the ⎓ DC OUT/VIDEO IN connector [2] cannot be used simultaneously.

[2] ⎓ **DC OUT (DC power output)/VIDEO IN (video input) connector** (BNC type)
Used to connect to a camera using a coaxial cable.
DC power is supplied to the camera, and the video signal is transmitted from the camera. When connecting a camera which can add the sync signals to the DC power voltage (AVC-D7CE), the sync signal can be transmitted to the camera through this connector.
This connector and the CAMERA connector [1] cannot be used simultaneously.

[3] **VIDEO OUT (video output) 1,2 connectors** (BNC type)
The video signal supplied from the camera is output from this connector.

[4] **HD IN/OUT (HD signal input/output) connectors** (BNC type) **and 75 Ω termination switch**
Used to input/output the HD signal.
IN (input) connector
Used to input the HD signal.
The input HD signal is transmitted to the camera through the CAMERA connector [1] or ⎓ DC OUT/VIDEO IN connector [2].
OUT (output) connector
The signal supplied to the IN connector is directly fed out from this connector.
75 Ω termination switch
When only the IN connector is used, set this switch to ON.
When both the IN and OUT connectors are used, set it to OFF.

[5] **VD IN/OUT (VD signal input/output) connectors** (BNC type) **and 75 Ω termination switch**
Used for VBS, VS, SYNC or VD signal connection.
IN (input) connector
Used to input the VBS, VS, SYNC or VD signal.
The input signal is transmitted to the camera through the CAMERA connector or the ⎓ DC OUT/VIDEO IN connector.
OUT (output) connector
The signal supplied to the IN connector is directly fed out from this connector.
75 Ω termination switch
When only the IN connector is used, set this switch to ON.
When both the IN and OUT connectors are used, set it to OFF.

[6] **~AC IN receptacle**
Used to connect to an AC outlet using the supplied AC power cord.

1-4. CONNECTION EXAMPLES

1-4-1. Supplying Power to the AVC-D7CE

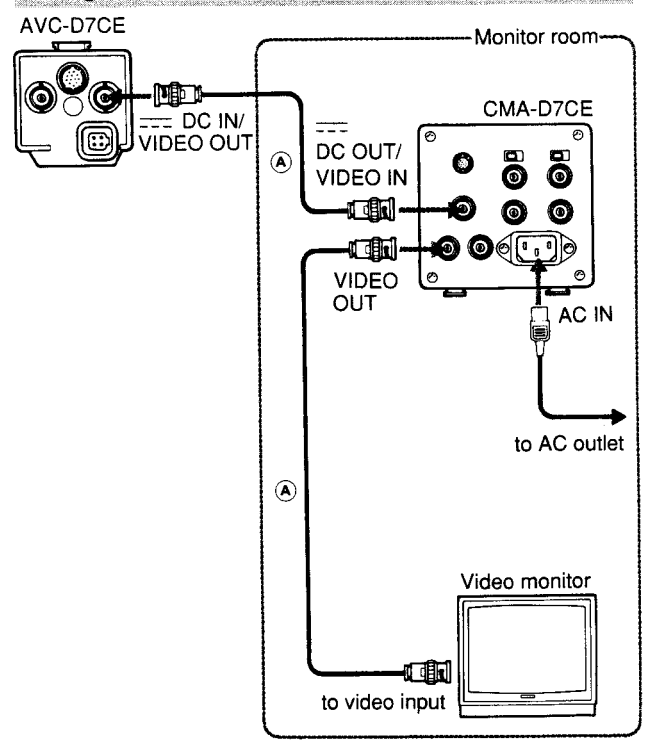
Only one camera can be connected to the CMA-D7CE.
There are two ways to supply the power from this unit to the AVC-D7CE CCD video camera.
- Using a 75-ohm coaxial cable between the ⎓ DC IN/VIDEO OUT connector of the AVC-D7CE and the ⎓ DC OUT/VIDEO IN connector of the CMA-D7CE
- Using a CCMC 12-pin cable between the ⎓ DC IN 11-16 V 3.3 W connector of the AVC-D7CE and the CAMERA connector of the CMA-D7CE

Make only one of the above connections. If both power connections are made at the same time, the camera will not output the video signal properly.

Note

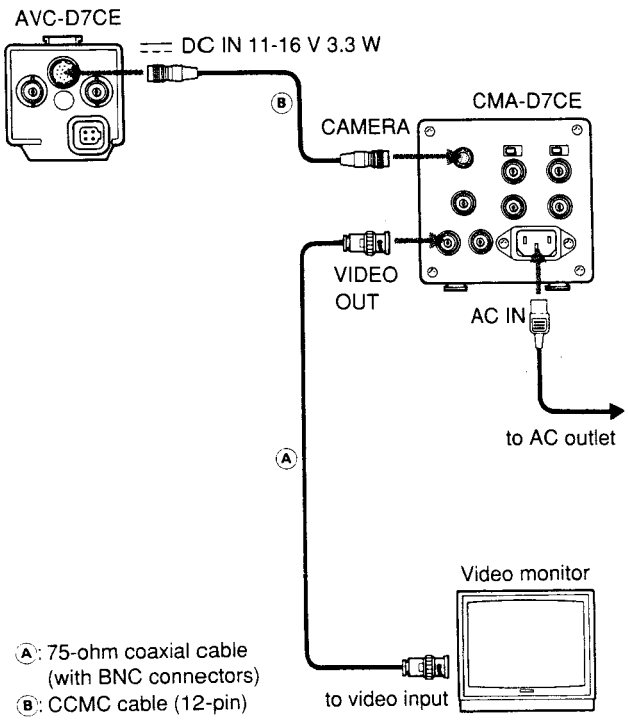
If the unit is turned on before connections are made, this unit may be deactivated by the breaker. In this case, turn the unit off and connect the camera correctly. And after that, turn the unit on again.

Using the ⎓ DC OUT/VIDEO IN connector



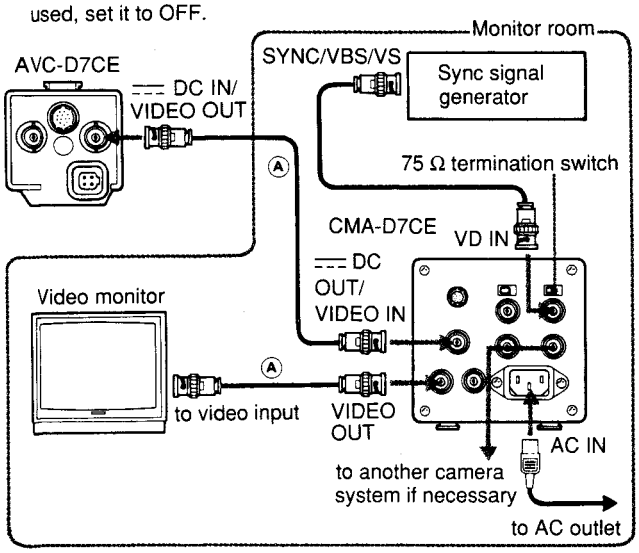
Ⓐ: 75-ohm coaxial cable (with BNC connectors)

Using the CAMERA connector



Supplying power and the sync signal and transmitting the video signal to the AVC-D7CE

- When this unit is used with the AVC-D7CE CCD video camera, the sync signals can be added to the power supplied through this unit. For the switch setting of the AVC-D7CE, refer to the operating instruction manual of the AVC-D7CE.
- When only the VD IN connector is used, set the 75 Ω termination switch to ON. When both the VD IN and OUT connectors are used, set it to OFF.



1-5. SPECIFICATIONS

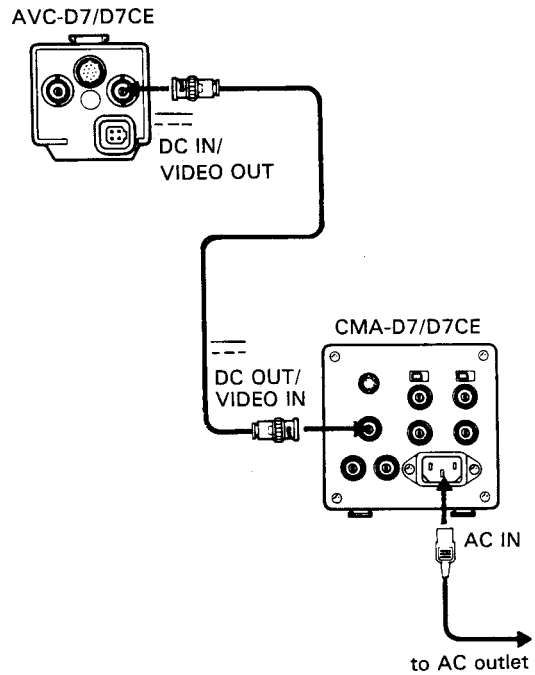
Power requirements
220 – 240 V, 50 Hz
Power consumption
35 W
Inputs and outputs VIDEO OUT: BNC type
Video 0.7 Vp-p, Sync 0.3 Vp-p,
75 ohms, unbalanced, sync negative
⎓ VIDEO IN/DC OUT: BNC type
28 V DC, 0.25 A
Video 0.7 Vp-p, Sync 0.3 Vp-p,
75 ohms, unbalanced, sync negative
CAMERA: 12-pin multi
12 V DC, 0.3 A
HD IN/OUT: BNC type
Loop-through, with 75 Ω termination switch
VD IN/OUT: BNC type
Loop-through, with 75 Ω termination switch
Operating temperature
0°C to +40°C (32°F to 104°F)
Storage temperature
-20°C to +60°C (-4°F to +140°F)
Dimensions Approx. 105 × 100 × 230 mm (w/h/d)
(4 1/4 × 4 × 9 1/8 inches)
Weight Approx. 2.7 kg (5 lb 13 oz)
Supplied accessories
AC power cord (1)
Operation manual (1)

Design and specifications are subject to change without notice.

CHAPTER 2
ALIGNMENT

2-1. EQUIPMENT REQUIRED

- Digital Voltmeter
- Oscilloscope
- Sync Signal Generator
- AVC-D7/D7CE
- Coaxial Cable (100 m)



2-2.ADJUSTMENT

2-2-1. +44 V Voltage Adjustment

Measuring point: CN 2-5 pin
Adjustment point: ◐ RV1/PS-204 board
Specification: +44 ±0.1 Vdc
Note: Be sure to be connected to AVC-D7/D7CE.

2-2-2. +9 V Voltage Adjustment

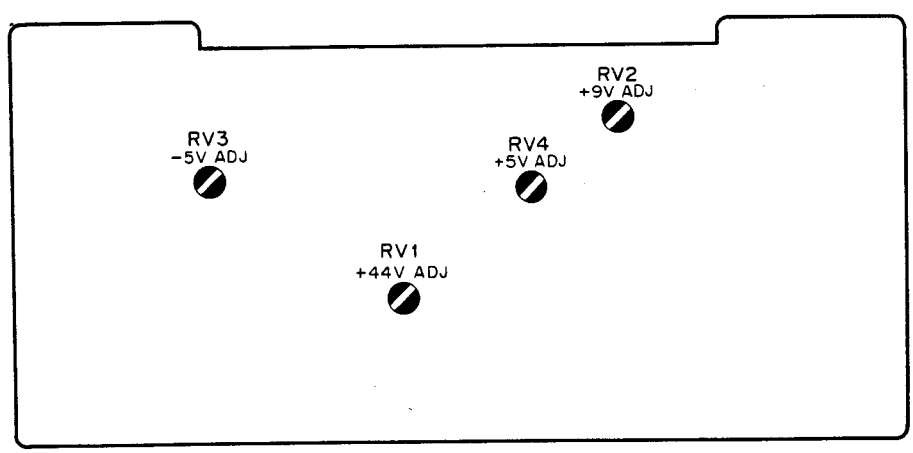
Measuring point: CN 6-1 pin
Adjustment point: ◐ RV2/PS-204 board
Specification: +9.0 ±0.1 Vdc

2-2-3. +5 V Voltage Adjustment

Measuring point: CN 6-7 pin
Adjustment point: ◐ RV4/PS-204 board
Specification: +5.0 ±0.1 Vdc

2-2-4. −5 V Voltage Adjustment

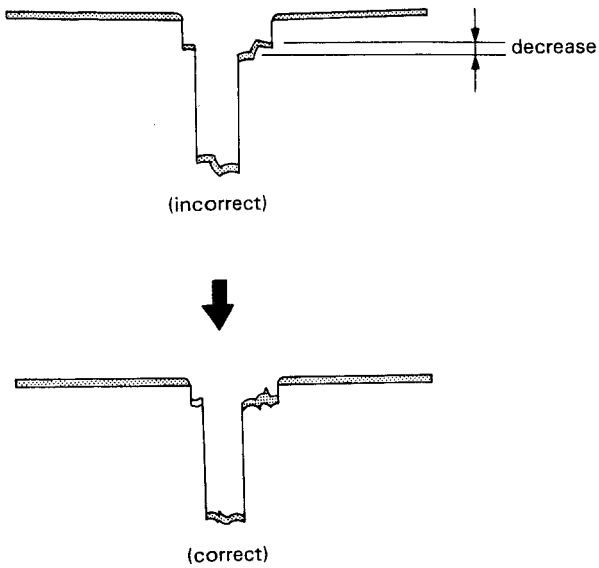
Measuring point: CN 6-3 pin
Adjustment point: ◐ RV3/PS-204 board
Specification: −5.0 ±0.1 Vdc

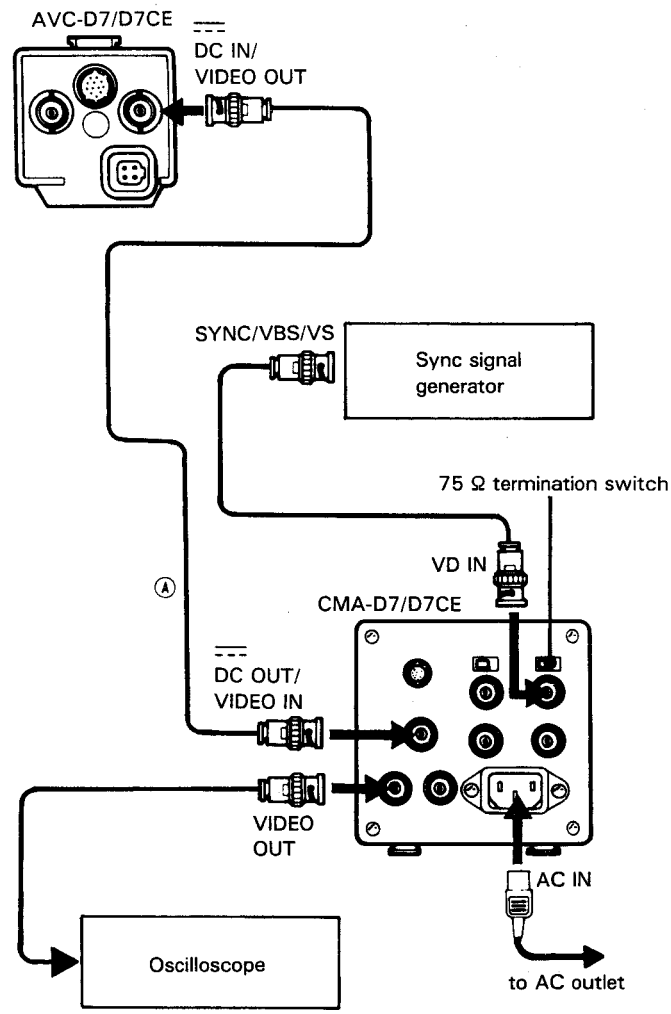


PS-204 board (Soldering side)

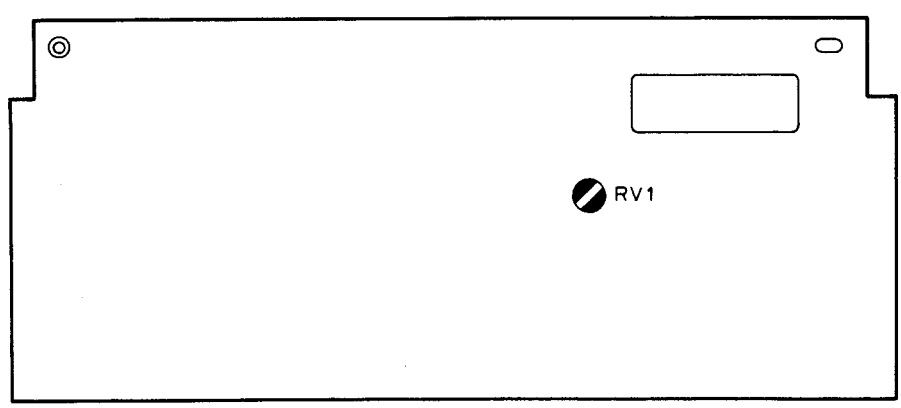
2-3. COMPENSATION OF STAGE DIFFERENCE DUE TO CABLE EXTENSION

Measuring point: CMA-D7 VIDEO OUT
Adjustment point: ◐ RV1/MS-34 board
Adjustment: Adjust so that the stage difference created at the SYNC section is minimum when the 100 m coaxial cable (BNC type) is connected and sync superimposition is performed.





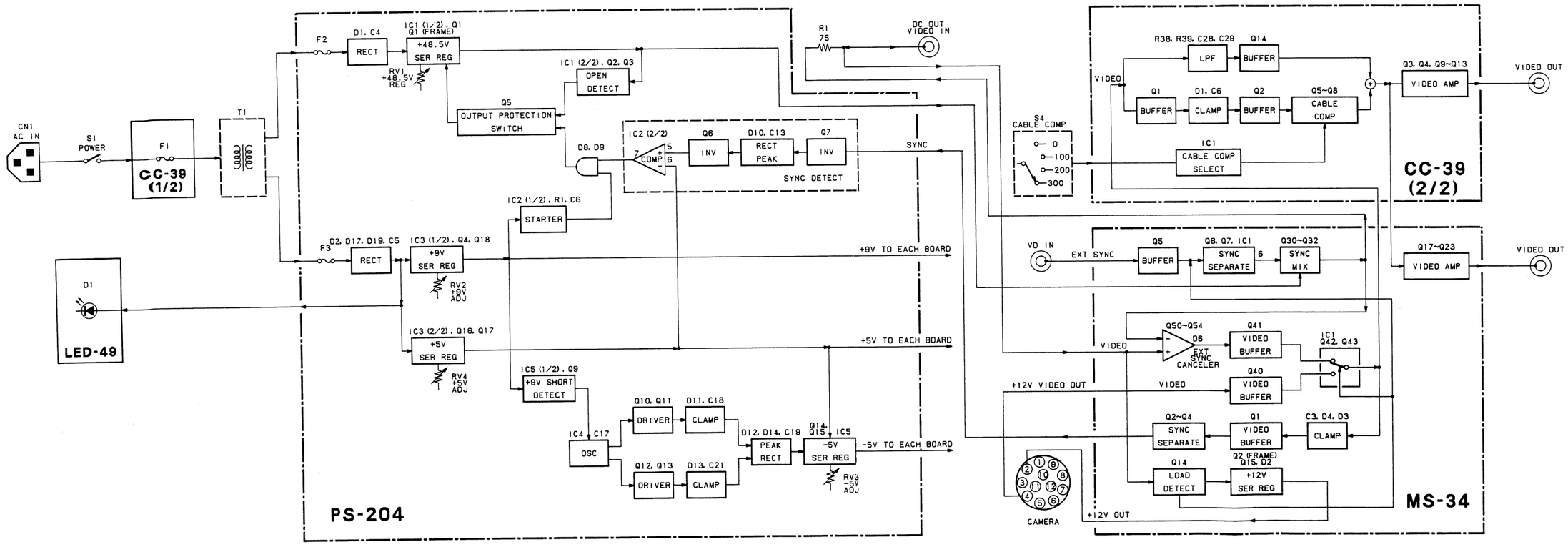
Ⓐ: 75-ohm coaxial cable RG-6A/U (with BNC connector, 100 m)



MS-34 board (Soldering Side)

CHAPTER 3
THEORY OF OPERATION

3-1. BLOCK DIAGRAM



OVERALL BLOCK

CMA-D7 (J, UC)
CMA-D7CE (EK)

3-2. OUTLINE

The CMA-D7/CE is a camera adaptor for power supply to be assembled with the AVC-D7/CE or SSC-D7.
There are 2 power supply systems. One of them transmits the video signal and the power simultaneously through one coaxial cable, while the other one employs a CCMC (multi 12-pin) cable to transmit the signal.
When this camera adaptor is assembled with the AVC-D7/CE, both power supply systems described above are possible. In the former one, the maximum extendible length of the coaxial cable is 300 m, using a 5C-2V coaxial cable, and cable compensation can be performed for every 100 m. Simultaneous transmission of the video signal, power and sync signal is also possible. The latter one enables external synchronization with the HD/VD signals for signal transmission. When this camera adaptor is assembled with the SSC-D7, signal transmission by the CCMC cable only is possible.

3-3. PS-204 BOARD

A stable supply voltage necessary for each board is provided at this board.
a. +9V
b. +/−5V
c. Power source for DC superimposition (28.0V DC)

3-4. CC-39 BOARD

The circuit that compensates the amplitude and frequency deterioration caused by the cable extension during DC superimposition/sync superimposition, is mainly composed by Q5, 6, 7 and 8. The video signal subjected to cable compensation is conducted to the video amplifier (Q3, 4, 9, 10, 11, 12 and 13) and output through one of the 2 outputs.

3-5. MS-34 BOARD

At sync superimposition, the sync component has to be separated from the video signal or sync signal input from the periphery (SYNC SEPARATION) and superimposed to the DC power source. This circuit is mainly composed by Q5, 6, 7, 30, 31 and 32. The video signal from the camera and the external sync signal from the power source equipment pass through the differential circuit composed by Q50, 51, 52, 53 and 54, and are output at the video amplifier (Q17 through Q23).
For detection whether the video signal is output from the camera or not when power is supplied (malfunction protection), the camera signal is sync-separated at Q1 through Q4.

3-6. CN-395 BOARD

This board inputs and outputs the signals to and from the external equipment. It contains the following terminals:
Multi 12-pin terminal (power source, video, sync)
DC OUT/VIDEO IN terminal (BNC)
2 VIDEO terminals (BNC)

3-7. CN-403 BOARD

This board inputs and outputs the external sync signal. The loop-through outputs for the HD signal and VD signal are provided and the termination is possible with the 75 ohm ON/OFF switch.

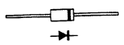
3-8. LED-49 BOARD

When the power is ON, the green LED lights.

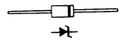
Di, Tr IC

CHAPTER 4
SCHEMATIC DIAGRAM

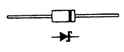
4-1. SEMICON DUCTOR PIN ASSIGNMENTS



1S155
1SS11
1SS14



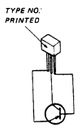
1SZ??
RD??EB?
RD??ESB?



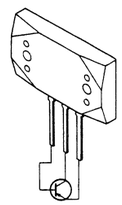
ERA81-004
ERA81-005

S4VB20
S4VB60

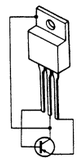
2SA1005
2SA1005-K



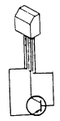
2SA1175-E



2SA1493

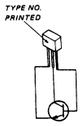


2SA771
2SB1015

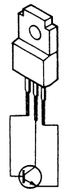


2SB733
2SB734

2SC2458
2SC2668

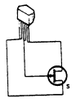


2SC2785F
2SC2787



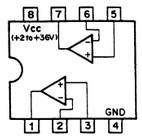
2SD1406

2SD774-4

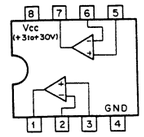


2SK184

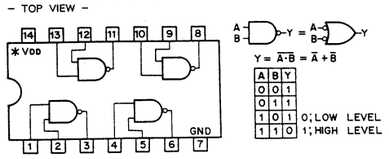
LM2903DQ (RAYTHEON)
VOLTAGE COMPARATOR
– TOP VIEW –



μPC358C (NEC)
DUAL OPERATIONAL AMPLIFIERS
— TOP VIEW —

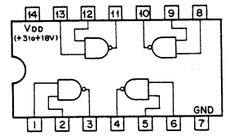


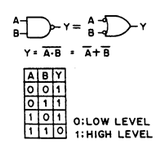
SN74HC00N (T1)
TC74HC00P (TOSHIBA)
C-MOS 2-INPUT NAND GATE
– TOP VIEW –



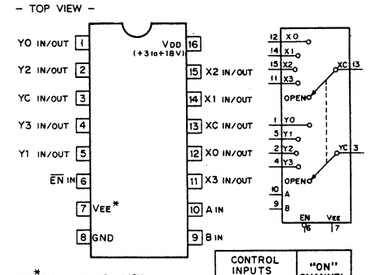
*VDD AC, HC; +2 to +6V
HCT; +5V

TC4011BP (TOSHIBA)
C-MOS 2-INPUT NAND GATE
— TOP VIEW —





TC4052BP (TOSHIBA)
TC4052BPHB (TOSHIBA)
C-MOS 4-CHANNEL MULTIPLEXER/DEMULTIPLEXER
– TOP VIEW –

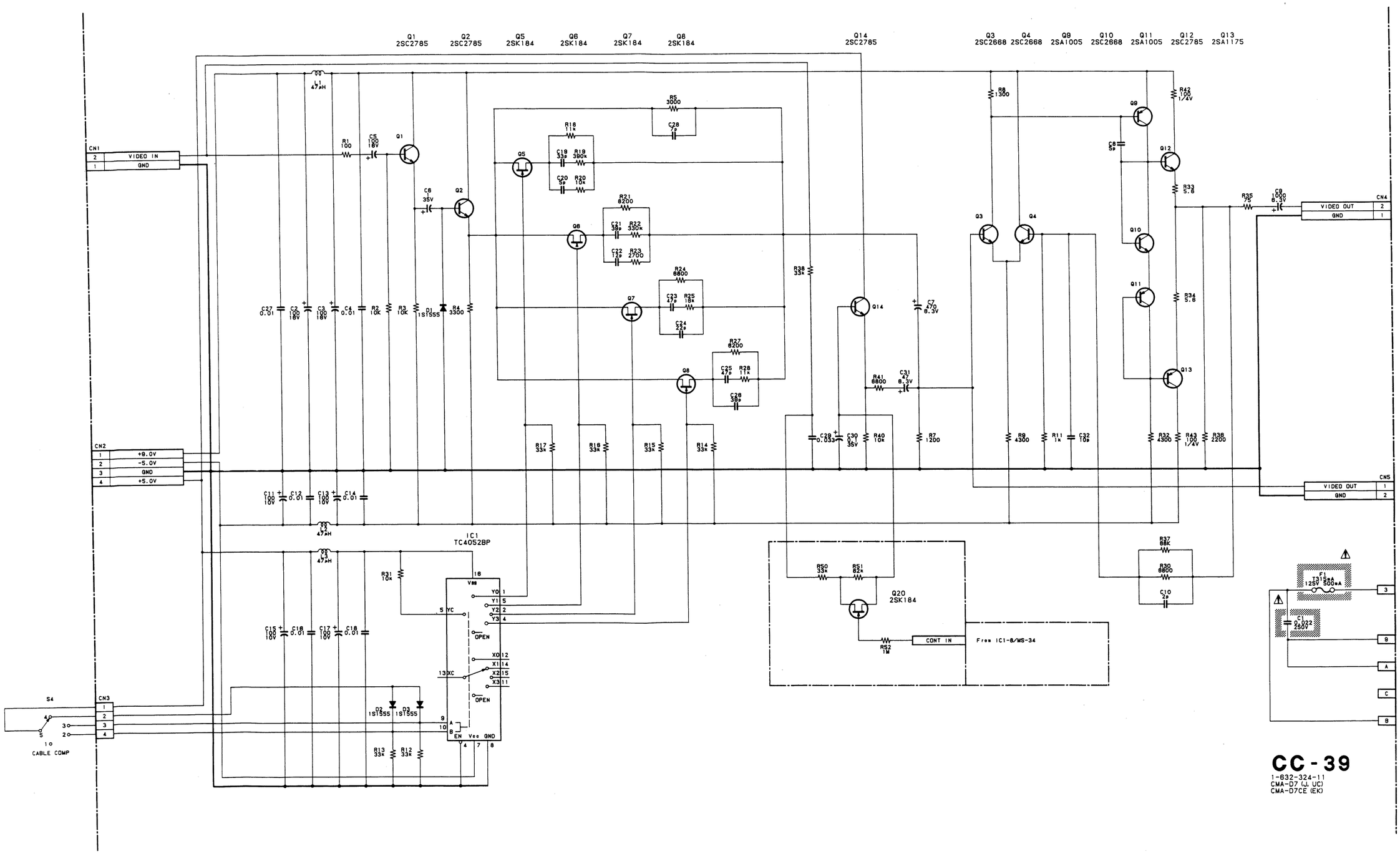


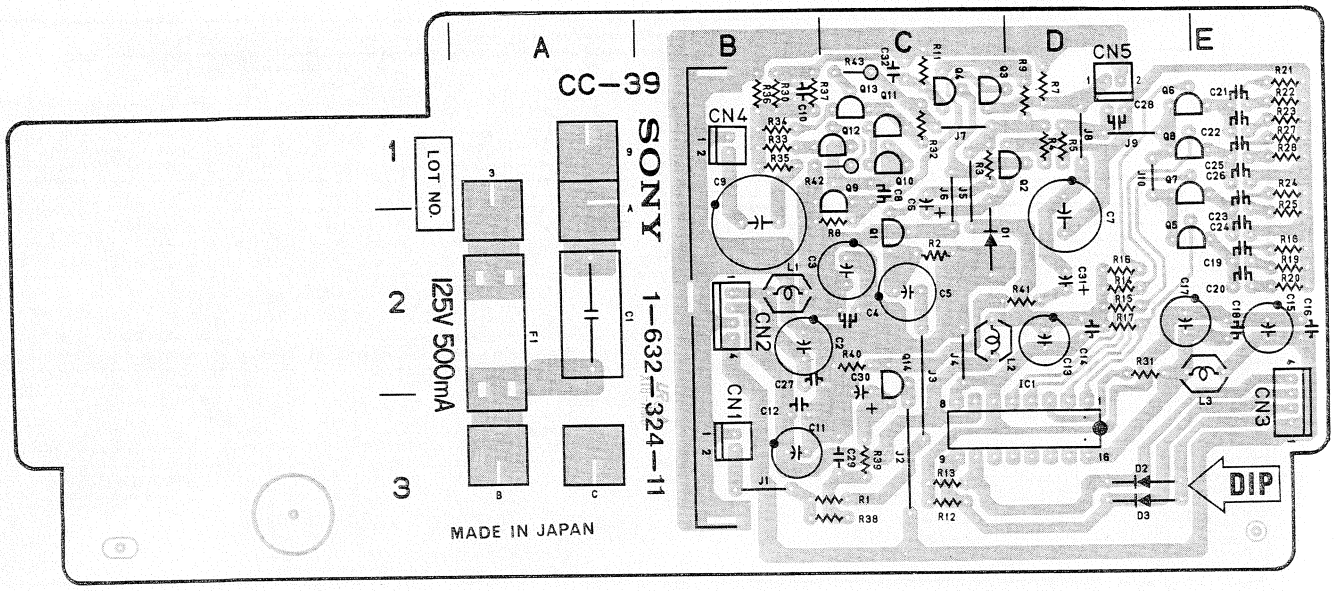
VEE*; VDD – VEE = +3 to +18V

CONTROL INPUTS			"ON" CHANNEL
EN	B	A	
0	0	0	0
0	0	1	1
0	1	0	2
0	1	1	3
1	X	X	OPEN

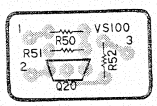
0; LOW LEVEL
1; HIGH LEVEL
X; DON'T CARE.

4-2. CC-39 BOARD





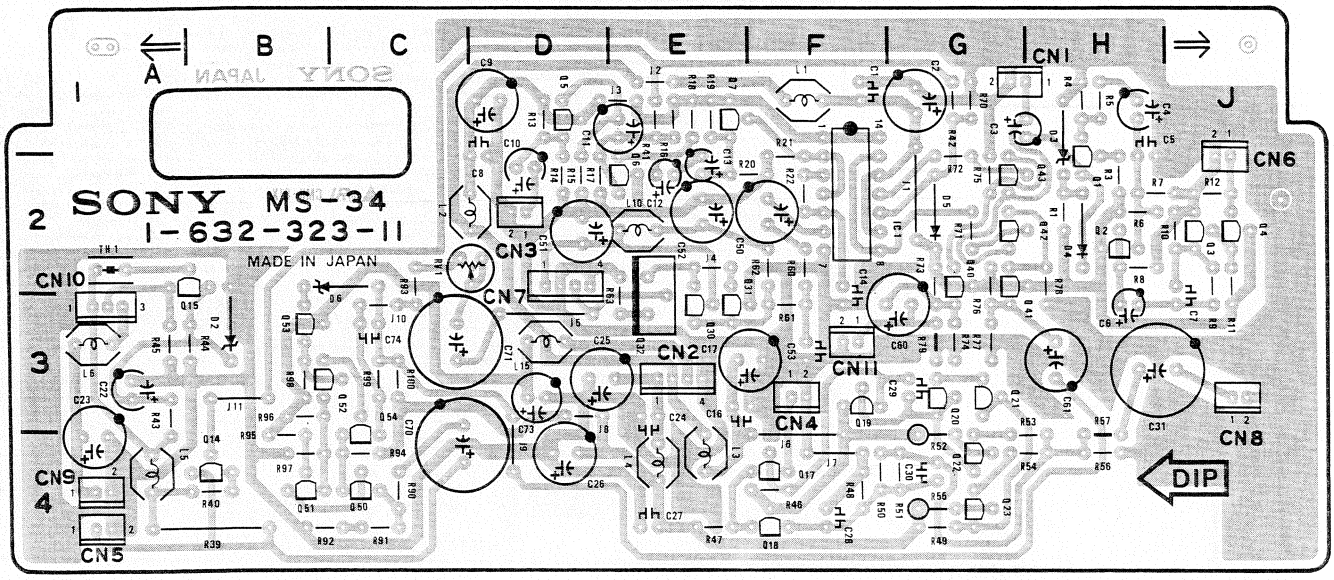
CC-39 —COMPONENT SIDE—
1-632-324-11
CMA-D7 (J, UC)
CMA-D7CE (EK)



COMPONENT SIDE

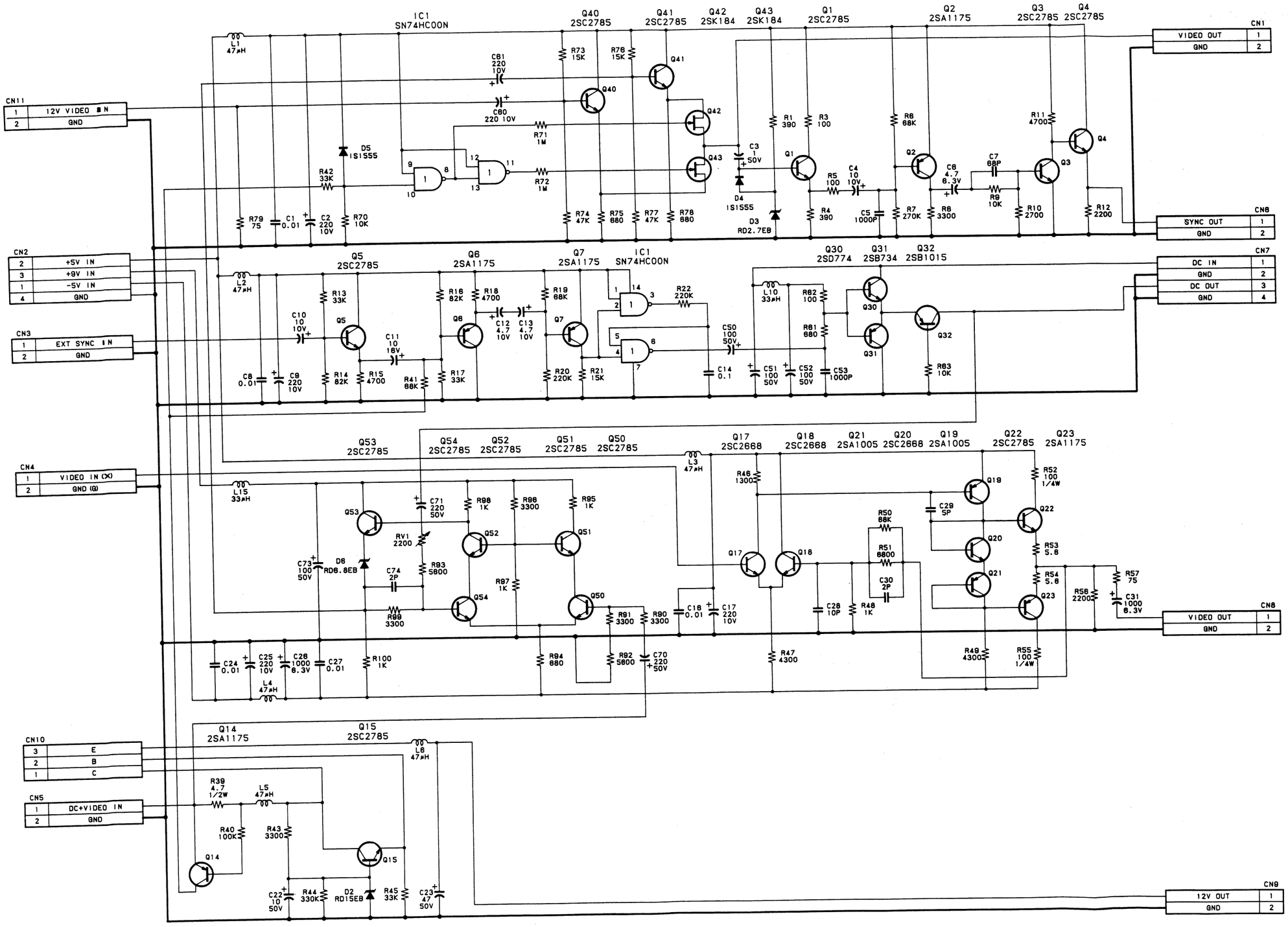
C1	A-2	C28	D-1	J8	D-1	R5	D-1	R36	B-1
C2	B-2	C29	C-3	J9	D-1	R7	D-1	R37	B-1
C3	C-2	C30	C-2	J10	D-1	R8	C-2	R38	C-3
C4	C-2	C31	D-2			R9	D-1	R39	C-3
C5	C-2	C32	C-1	L1	B-2	R11	C-1	R40	C-2
C6	C-2			L2	C-2	R12	C-3	R41	D-2
C7	D-2	CN1	B-3	L3	E-2	R13	C-3	R42	C-1
C8	C-1	CN2	B-2			R14	D-2	R43	C-1
C9	B-2	CN3	E-3	Q1	C-2	R15	D-2		
C10	B-1	CN4	B-1	Q2	D-1	R16	D-2		
C11	B-3	CN5	D-1	Q3	C-1	R17	D-2		
C12	B-3			Q4	C-1	R18	E-2		
C13	D-2	D1	C-2	Q5	D-2	R19	E-2		
C14	D-2	D2	D-3	Q6	D-1	R20	E-2		
C15	E-2	D3	D-3	Q7	D-1	R21	E-1		
C16	E-2			Q8	D-1	R22	E-1		
C17	D-2	F1	A-2	Q9	C-1	R23	E-1		
C18	E-2			Q10	C-1	R24	E-1		
C19	E-2	IC1	D-3	Q11	C-1	R25	E-2		
C20	E-2			Q12	C-1	R27	E-1		
C21	E-1	J1	B-3	Q13	C-1	R28	E-1		
C22	E-1	J2	C-3	Q14	C-2	R30	B-1		
C23	E-2	J3	C-2			R31	D-2		
C24	E-2	J4	C-2	R1	C-3	R32	C-1		
C25	E-1	J5	C-1	R2	C-2	R33	B-1		
C26	E-1	J6	C-1	R3	C-1	R34	B-1		
C27	B-2	J7	C-1	R4	D-1	R35	B-1		

4-3. MS-34 BOARD



MS-34 —COMPONENT SIDE—
1-632-323-11
CMA-D7 (J, UC)
CMA-D7CE (EK)

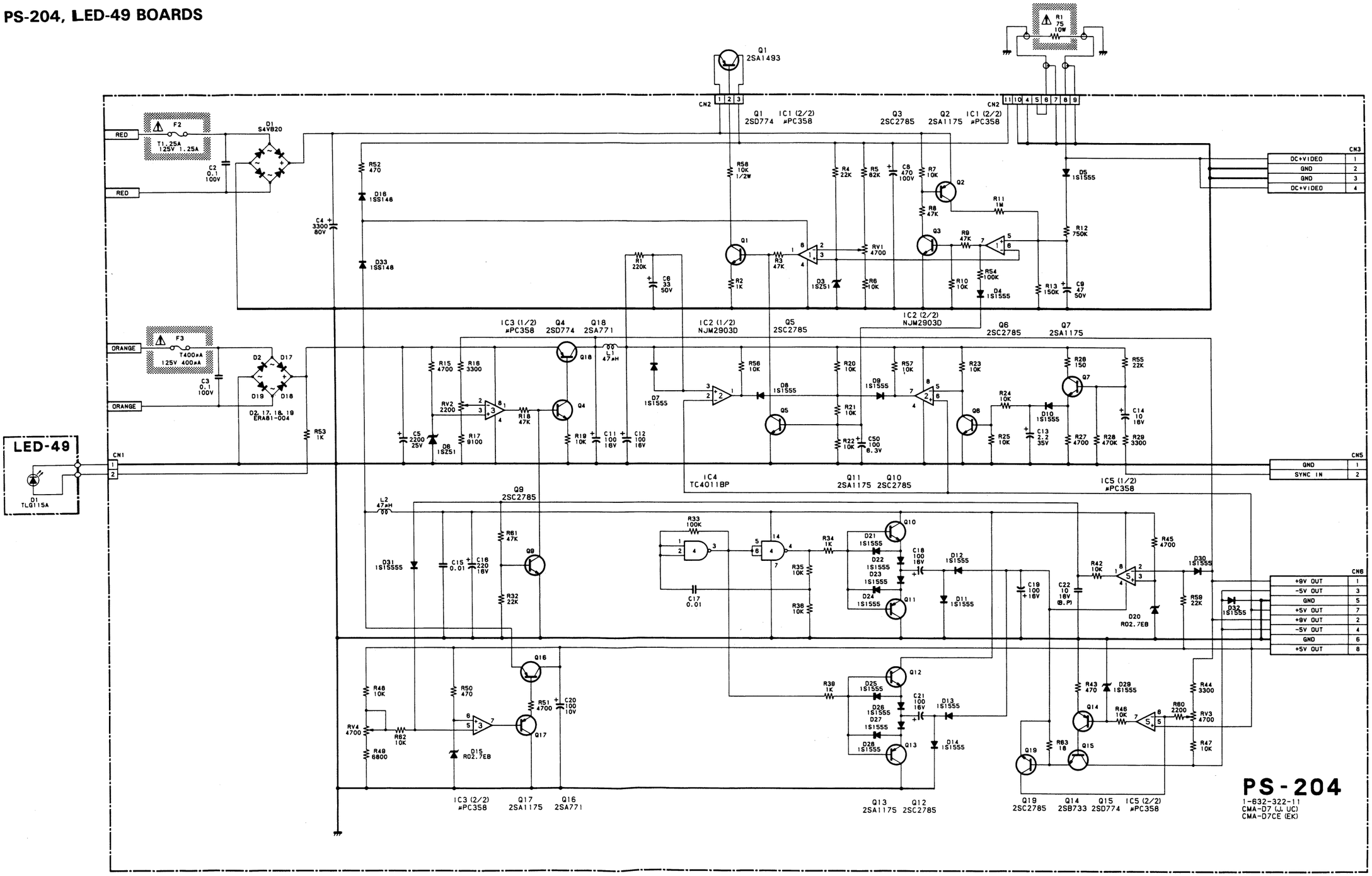
C1	F-1	C60	G-3	J5	D-3	Q21	G-3	R16	E-1	R70	G-1
C2	G-1	C61	H-3	J6	F-4	Q22	G-4	R17	D-2	R71	G-2
C3	G-1	C70	C-4	J7	F-4	Q23	G-4	R18	E-1	R72	G-2
C4	H-1	C71	C-3	J8	D-3	Q30	E-3	R19	E-1	R73	G-2
C5	H-1	C73	D-3	J9	D-4	Q31	E-3	R20	F-2	R74	G-3
C6	H-3	C74	C-3	J10	C-3	Q32	E-3	R21	F-2	R75	G-2
C7	J-3			J11	B-3	Q40	G-2	R22	F-2	R76	G-2
C8	D-2	CN1	H-1			Q41	G-2	R39	B-4	R77	G-3
C9	D-1	CN2	E-3	L1	F-1	Q42	G-2	R40	B-4	R78	H-2
C10	D-1	CN3	D-2	L2	C-2	Q43	G-2	R41	E-1	R79	G-3
C11	E-1	CN4	F-3	L3	E-4	Q50	C-4	R42	G-1	R90	C-4
C12	E-2	CN5	A-4	L4	E-4	Q51	B-4	R43	A-3	R91	C-4
C13	E-2	CN6	J-2	L5	A-4	Q52	B-3	R44	A-3	R92	B-4
C14	F-3	CN7	D-2	L6	A-3	Q53	B-3	R45	A-3	R93	C-2
C16	E-3	CN8	J-3	L10	E-2	Q54	C-4	R46	F-4	R94	C-4
C17	E-3	CN9	A-4	L15	D-3			R47	E-4	R95	B-4
C22	A-3	CN10	A-3			R1	H-2	R48	F-4	R96	B-3
C23	A-4	CN11	F-3	Q1	H-2	R3	H-2	R49	G-4	R97	B-4
C24	E-3			Q2	H-2	R4	H-1	R50	F-4	R98	B-3
C25	D-3	D2	B-3	Q3	J-2	R5	H-1	R51	G-4	R99	C-3
C26	D-4	D3	H-1	Q4	J-2	R6	H-2	R52	G-4	R100	C-3
C27	E-4	D4	H-2	Q5	D-1	R7	H-2	R53	H-4		
C28	F-4	D5	G-2	Q6	E-2	R8	H-2	R54	H-4	RV1	C-2
C29	G-3	D6	C-2	Q7	E-1	R9	J-2	R55	G-4		
C30	G-4	IC1	F-2	Q14	B-4	R10	J-2	R56	H-4	TH1	A-2
C31	H-3			Q15	A-2	R11	J-2	R57	H-4		
C50	F-2	J1	G-2	Q17	F-4	R12	J-2	R60	F-2		
C51	D-2	J2	E-1	Q18	F-4	R13	D-1	R61	F-3		
C52	E-2	J3	E-1	Q19	F-3	R14	D-2	R62	F-2		
C53	F-3	J4	E-2	Q20	G-3	R15	D-2	R63	E-3		



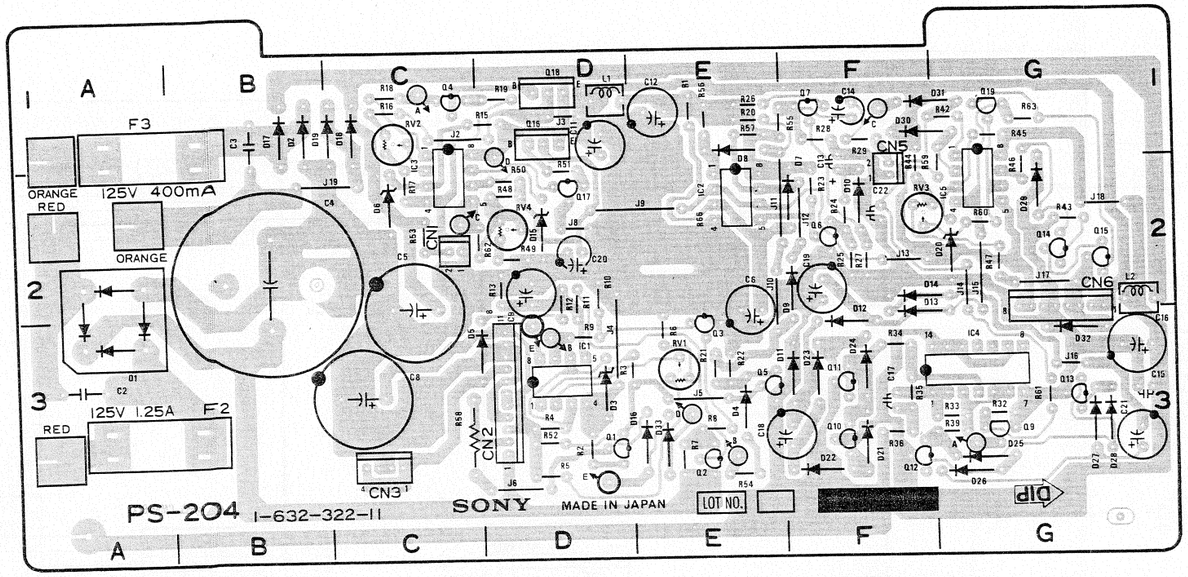
MS-34

1-632-323-11
CMA-D7 (J, UC)
CMA-D7CE (EK)

4-4. PS-204, LED-49 BOARDS



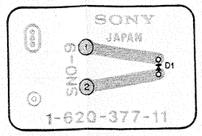
PS-204, LED-49



PS-204 —COMPONENT SIDE—

1-632-322-11
CMA-D7 (J, UC)
CMA-D7CE (EK)

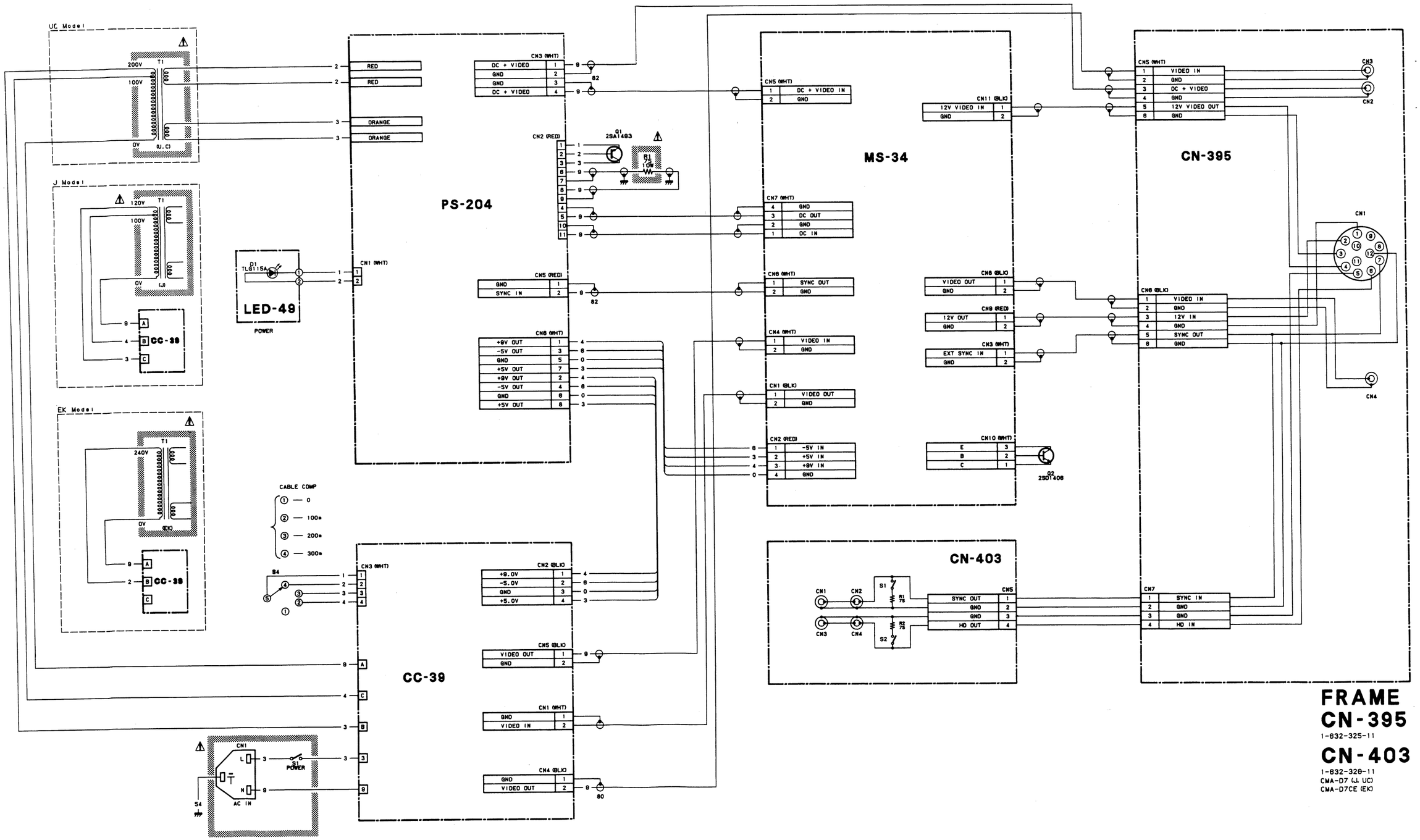
C2	A-3	D1	A-3	D29	G-2	J16	G-3	R1	E-1	R32	G-3	RV1	E-3
C3	B-1	D2	B-1	D30	F-1	J17	G-2	R2	D-3	R33	G-3	RV2	C-1
C4	B-2	D3	D-3	D31	F-1	J18	G-2	R3	D-3	R34	F-3	RV3	F-2
C5	C-2	D4	E-3	D32	G-3	J19	C-2	R4	D-3	R35	F-3	RV4	D-2
C6	E-3	D5	C-3	D33	E-3			R5	D-3	R36	F-3		
C8	C-3	D6	C-2			L1	D-1	R6	E-3	R39	G-3		
C9	D-2	D7	F-2	F2	A-3	L2	G-2	R7	E-3	R42	G-1		
C11	D-1	D8	E-1	F3	A-1			R8	E-3	R43	G-2		
C12	E-1	D9	F-2			Q1	D-3	R9	D-3	R44	F-2		
C13	F-2	D10	F-2	IC1	D-3	Q2	E-3	R10	D-2	R45	G-1		
C14	F-1	D11	F-3	IC2	E-2	Q3	E-3	R11	D-2	R46	G-2		
C15	G-3	D12	F-3	IC3	C-2	Q4	C-1	R12	D-2	R47	G-2		
C16	G-3	D13	F-3	IC4	G-3	Q5	E-3	R13	D-2	R48	D-2		
C17	F-3	D14	F-2	IC5	G-2	Q6	F-2	R15	D-1	R49	D-2		
C18	E-3	D15	D-2			Q7	F-1	R16	C-1	R50	D-2		
C19	F-2	D16	E-3	J2	C-1	Q9	G-3	R17	C-2	R51	D-2		
C20	D-2	D17	B-1	J3	D-1	Q10	F-3	R18	C-1	R52	D-3		
C22	F-2	D18	C-1	J4	D-3	Q11	F-3	R19	D-1	R53	C-2		
C21	G-3	D19	C-1	J5	E-3	Q12	F-3	R20	E-1	R54	E-3		
		D20	G-2	J6	D-3	Q13	G-3	R21	E-3	R55	F-1		
CN1	C-2	D21	F-3	J8	D-2	Q14	G-2	R22	E-3	R56	E-1		
CN2	D-3	D22	F-3	J9	E-2	Q15	G-2	R23	F-2	R57	E-1		
CN3	C-3	D23	F-3	J10	E-2	Q16	D-1	R24	F-2	R58	C-3		
CN5	F-2	D24	F-3	J11	E-2	Q17	D-2	R25	F-2	R59	G-2		
CN6	G-2	D25	G-3	J12	F-2	Q18	D-1	R26	E-1	R60	G-2		
		D26	G-3	J13	F-2	Q19	G-1	R27	F-2	R61	G-3		
		D27	G-3	J14	G-2			R28	F-1	R62	D-2		
		D28	G-3	J15	G-2			R29	F-1	R63	G-1		



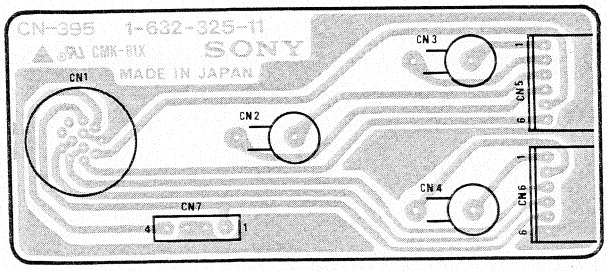
LED-49

—SOLDERING SIDE—
1-620-377-11
CMA-10
CMA-10CE
CMA-D7 (J, UC)
CMA-D7CE (EK)

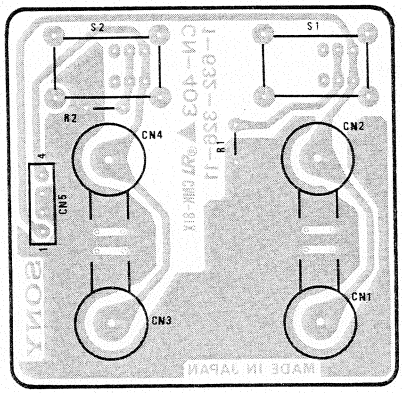
4-5. CN-395, CN-403 BOARDS, FRAME



FRAME
CN-395
1-632-325-11
CN-403
1-632-326-11
CMA-D7 (J, UC)
CMA-D7CE (EK)



CN-395 —SOLDERING SIDE—
1-632-325-11
CMA-D7 (J, UC)
CMA-D7CE (EK)



CN-403 —COMPONENT SIDE—
1-632-326-11
CMA-D7 (J, UC)
CMA-D7CE (EK)

CHAPTER 5
REPAIR PARTS

5-1. PARTS INFORMATION

1. **Safety Related Components Warning.**
   Components identified by shading marked with ⚠ on the schematic diagrams, exploded views and electrical spare parts list are critical to safe operation. Replace these components with Sony parts whose part numbers appear in this manual or in service bulletins and service manual supplements published by Sony.

2. Replacement Parts supplied from Sony Parts Center will sometimes have a different shape from the original parts. This is due to "accommodating the improved parts and/or engineering changes" or "standardization of genuine parts".
   This manual's exploded views and electrical repair parts list indicate the parts numbers of "the standardized genuine parts at present". Regarding engineering parts changes in our engineering department, refer to Sony service bulletins and service manual supplement.

3. Items marked " * " are not stocked since they are seldom required for routine service. Some delay should be anticipated when ordering these items.

4. Abbreviations

Ref.No.	Description	Ref.No.	Description
C??,CV??	CAPACITOR	CN??	CONNECTOR
CP??	COMBINATION PARTS	D??	DIODE
DL??	DELAY LINE	F??	FUSE
FL??	FILTER	IC??	IC
L??,LV??	INDUCTOR	M??	MOTOR
ME??	METER	PL??	LAMP
Q??	TRANSISTOR	R??,RV??	RESISTOR
RY??	RELAY	SW??	SWITCH
T??	TRANSFORMER	TH??	THERMISTOR
X??	CRYSTAL		

5. Units for Capacitors, Inductors and Resistors
   The following units are assumed in schematic diagrams, electrical parts list and exploded views unless otherwise specified:
   Capacitors: micro farad
   Inductors: micro henries
   Resistor: ohm

5-2. ELECTRICAL PARTS LIST

5-2-1. CC-39 Board

Ref No.	Part No.	Description
⚠	*A-7515-049-A	COMPLETE PCB, CC-39 (UC MODEL)
	*A-7515-052-A	COMPLETE PCB, CC-39P (EK MODEL)
	1-533-037-XX	HOLDER, FUSE
	*3-701-948-09	LABEL (T315MA), FUSE (EK MODEL)

Ref No.	Part No.	Description			
⚠C1	1-136-211-00	FILM	0.022	20%	250V
C2,3	1-124-455-00	ELECT	100	20%	16V
C4	1-161-051-00	CERAMIC	0.01	10%	25V
C5	1-124-455-00	ELECT	100	20%	16V
C6	1-131-347-00	TANTALUM	1	10%	35V
C7	1-124-135-00	ELECT	470	20%	6.3V
C8	1-102-942-00	CERAMIC	5PF	0.5PF	50V
C9	1-124-471-00	ELECT	1000	20%	6.3V
C10	1-102-935-00	CERAMIC	2PF	0.25PF	50V
C11	1-124-584-00	ELECT	100	20%	10V
C12	1-161-051-00	CERAMIC	0.01	10%	25V
C13	1-124-584-00	ELECT	100	20%	10V
C14	1-161-051-00	CERAMIC	0.01	10%	25V
C15	1-124-584-00	ELECT	100	20%	10V
C16	1-161-051-00	CERAMIC	0.01	10%	25V
C17	1-124-584-00	ELECT	100	20%	10V
C18	1-161-051-00	CERAMIC	0.01	10%	25V
C19	1-102-963-00	CERAMIC	33PF	10%	50V
C20	1-102-942-00	CERAMIC	5PF	0.5PF	50V
C21	1-102-965-00	CERAMIC	39PF	5%	50V
C22	1-102-949-00	CERAMIC	12PF	10%	50V
C23	1-101-880-00	CERAMIC	47PF	10%	50V
C24	1-102-959-00	CERAMIC	22PF	5%	50V
C25	1-101-880-00	CERAMIC	47PF	10%	50V
C26	1-102-965-00	CERAMIC	39PF	5%	50V
C27	1-161-051-00	CERAMIC	0.01	10%	25V
C28	1-102-944-00	CERAMIC	7PF	0.5PF	50V
C29	1-161-057-00	CERAMIC	0.033	10%	25V
C30	1-131-341-00	TANTALUM	0.1	10%	35V
C31	1-131-381-00	TANTALUM	47	10%	6.3V
C32	1-102-947-00	CERAMIC	10PF	0.5PF	50V

Ref No.	Part No.	Description
CN1	*1-506-467-11	2P
CN2,3	*1-506-469-11	4P
CN4,5	*1-506-467-11	2P
D1-3	8-719-911-19	1SS119

Ref No.	Part No.	Description
⚠F1	1-532-235-00	FUSE, TIME LAG (EK MODEL)
	1-532-737-11	FUSE, GLASS TUBE (UC MODEL)
IC1	8-759-208-08	TC4052BPHB
L1-3	1-408-417-00	MICRO 47
Q1,2	8-729-119-78	2SC2785-HFE
Q3,4	8-729-266-83	2SC2668
Q5-8	8-729-218-43	2SK184-GR
Q9	8-729-110-53	2SA1005
Q10	8-729-266-83	2SC2668
Q11	8-729-110-53	2SA1005
Q12	8-729-119-78	2SC2785-HFE
Q13	8-729-119-76	2SA1175-HFE
Q14	8-729-178-73	2SC2787
Q20	8-729-218-43	2SK184-GR

Ref No.	Part No.	Description			
R1	1-249-405-11	CARBON	100	5%	1/4W
R2,3	1-249-429-11	CARBON	10K	5%	1/4W
R4	1-249-423-11	CARBON	3.3K	5%	1/4W
R5	1-247-842-11	CARBON	3K	5%	1/4W
R7	1-249-418-11	CARBON	1.2K	5%	1/4W
R8	1-247-834-11	CARBON	1.3K	5%	1/4W
R9	1-247-846-11	CARBON	4.3K	5%	1/4W
R11	1-249-417-11	CARBON	1K	5%	1/4W
R12-17	1-249-435-11	CARBON	33K	5%	1/4W
R18	1-247-856-00	CARBON	11K	5%	1/4W
R19	1-247-893-11	CARBON	390K	5%	1/4W
R20	1-249-429-11	CARBON	10K	5%	1/4W
R21	1-249-428-11	CARBON	8.2K	5%	1/4W
R22	1-247-891-00	CARBON	330K	5%	1/4W
R23	1-249-422-11	CARBON	2.7K	5%	1/4W
R24	1-249-427-11	CARBON	6.8K	5%	1/4W
R25	1-247-860-11	CARBON	16K	5%	1/4W
R27	1-247-850-11	CARBON	6.2K	5%	1/4W
R28	1-247-856-00	CARBON	11K	5%	1/4W
R30	1-249-427-11	CARBON	6.8K	5%	1/4W
R31	1-249-429-11	CARBON	10K	5%	1/4W
R32	1-247-846-11	CARBON	4.3K	5%	1/4W
R33,34	1-249-390-11	CARBON	5.6	5%	1/4W
R35	1-215-394-00	METAL	75	1%	1/6W
R36	1-249-421-11	CARBON	2.2K	5%	1/4W

Ref No.	Part No.	Description			
R37	1-249-439-11	CARBON	68K	5%	1/4W
R38	1-249-435-11	CARBON	33K	5%	1/4W
R40	1-249-429-11	CARBON	10K	5%	1/4W
R41	1-249-427-11	CARBON	6.8K	5%	1/4W
R42, 43	1-247-700-11	CARBON	100	5%	1/4W
R50	1-249-435-11	CARBON	33K	5%	1/4W
R51	1-249-440-11	CARBON	82K	5%	1/4W
R52	1-247-903-00	CARBON	1M	5%	1/4W

5-2-2. CN-395 Board

	*1-632-325-11	PC BOARD, CN-395
CN5, 6	*1-506-485-11	6P

5-2-3. CN-403 Board

	*1-632-326-11	PC BOARD, CN-403
R1, 2	1-247-804-11	CARBON 75 5% 1/4W
S1, 2	1-554-643-00	SLIDE

5-2-4. LED-49 Board

	*1-620-377-11	PC BOARD, LED-49
	*2-381-904-00	HOLDER, LED
D1	8-719-820-15	TLG115A

Ref No.	Part No.	Description			

5-2-5. MS-34 Board

	*A-7515-050-A	COMPLETE PCB, MS-34

C1	1-161-051-00	CERAMIC	0.01	10%	25V
C2	1-124-140-00	ELECT	220	20%	10V
C3	1-126-160-11	ELECT	1	20%	50V
C4	1-127-512-00	ELECT(SOLID)	10	20%	16V
C5	1-161-039-00	CERAMIC	0.001	10%	25V
C6	1-127-487-00	ELECT(SOLID)	4.7	20%	10V
C7	1-101-888-00	CERAMIC	68PF	5%	50V
C8	1-161-051-00	CERAMIC	0.01	10%	25V
C9	1-124-140-00	ELECT	220	20%	10V
C10, 11	1-127-512-00	ELECT(SOLID)	10	20%	16V
C12, 13	1-127-487-00	ELECT(SOLID)	4.7	20%	10V
C14	1-162-806-11	CERAMIC	0.1	10%	50V
C16	1-161-051-00	CERAMIC	0.01	10%	25V
C17	1-124-140-00	ELECT	220	20%	10V
C22	1-123-875-11	ELECT	10	20%	50V
C23	1-125-151-00	ELECT	47	20%	50V
C24	1-161-051-00	CERAMIC	0.01	10%	25V
C25	1-124-140-00	ELECT	220	20%	10V
C26	1-126-916-11	ELECT	1000	20%	6.3V
C27	1-161-051-00	CERAMIC	0.01	10%	25V
C28	1-102-947-00	CERAMIC	10PF	0.5PF	50V
C29	1-102-942-00	CERAMIC	5PF	0.5PF	50V
C30	1-102-935-00	CERAMIC	2PF	0.25PF	50V
C31	1-124-471-00	ELECT	1000	20%	6.3V
C50-52	1-124-122-11	ELECT	100	20%	50V
C53	1-102-074-00	CERAMIC	0.001	10%	50V
C60, 61	1-124-140-00	ELECT	220	20%	10V
C70, 71	1-124-911-11	ELECT	220		50V
C73	1-124-122-11	ELECT	100	20%	50V
C74	1-102-935-00	CERAMIC	2PF	0.25PF	50V

CN1	*1-506-467-11	2P
CN2	*1-506-469-11	4P
CN3-6	*1-506-467-11	2P
CN7	*1-506-469-11	4P
CN8, 9	*1-506-467-11	2P
CN10	*1-506-468-11	3P
CN11	*1-506-467-11	2P

D2	8-719-110-41	RD15ES-B2
D3	8-719-110-67	RD2.7ES-B2
D4, 5	8-719-911-19	1SS119
D6	8-719-109-97	RD6.8ES-B2

Ref No.	Part No.	Description
IC1	8-759-202-11	TC74HC00P
L1-6, 10	1-408-417-00	MICRO 47
L15	1-408-448-21	MICRO 33
Q1	8-729-119-78	2SC2785-HFE
Q2	8-729-119-76	2SA1175-HFE
Q3-5	8-729-119-78	2SC2785-HFE
Q6, 7, 14	8-729-119-76	2SA1175-HFE
Q15	8-729-119-78	2SC2785-HFE
Q17, 18	8-729-266-83	2SC2668
Q19	8-729-110-53	2SA1005
Q20	8-729-266-83	2SC2668
Q21	8-729-110-53	2SA1005
Q22	8-729-119-78	2SC2785-HFE
Q23	8-729-119-76	2SA1175-HFE
Q30	8-729-140-96	2SD774-34
Q31	8-729-140-97	2SB734-34
Q32	8-729-820-15	2SB1274-RS
Q40, 41	8-729-119-78	2SC2785-HFE
Q42, 43	8-729-218-43	2SK184-GR
Q50-54	8-729-119-78	2SC2785-HFE
R1	1-249-412-11	CARBON 390 5% 1/4W
R3	1-249-405-11	CARBON 100 5% 1/4W
R4	1-249-412-11	CARBON 390 5% 1/4W
R5	1-249-405-11	CARBON 100 5% 1/4W
R6	1-249-439-11	CARBON 68K 5% 1/4W
R7	1-247-889-00	CARBON 270K 5% 1/4W
R8	1-249-423-11	CARBON 3.3K 5% 1/4W
R9	1-249-429-11	CARBON 10K 5% 1/4W
R10	1-249-422-11	CARBON 2.7K 5% 1/4W
R11	1-249-425-11	CARBON 4.7K 5% 1/4W
R12	1-249-421-11	CARBON 2.2K 5% 1/4W
R13	1-249-435-11	CARBON 33K 5% 1/4W
R14	1-249-440-11	CARBON 82K 5% 1/4W
R15	1-249-425-11	CARBON 4.7K 5% 1/4W
R16	1-249-440-11	CARBON 82K 5% 1/4W
R17	1-249-435-11	CARBON 33K 5% 1/4W
R18	1-249-425-11	CARBON 4.7K 5% 1/4W
R19	1-249-439-11	CARBON 68K 5% 1/4W
R20	1-247-887-00	CARBON 220K 5% 1/4W
R21	1-249-431-11	CARBON 15K 5% 1/4W

Ref No.	Part No.	Description
R22	1-247-887-00	CARBON 220K 5% 1/4W
R39	1-249-482-11	CARBON 4.7 5% 1/2W
R40	1-249-441-11	CARBON 100K 5% 1/4W
R41, 42	1-249-439-11	CARBON 68K 5% 1/4W
R43	1-249-423-11	CARBON 3.3K 5% 1/4W
R44	1-247-891-00	CARBON 330K 5% 1/4W
R45	1-249-435-11	CARBON 33K 5% 1/4W
R46	1-247-834-11	CARBON 1.3K 5% 1/4W
R47	1-247-846-11	CARBON 4.3K 5% 1/4W
R48	1-249-417-11	CARBON 1K 5% 1/4W
R49	1-247-846-11	CARBON 4.3K 5% 1/4W
R50	1-249-439-11	CARBON 68K 5% 1/4W
R51	1-249-427-11	CARBON 6.8K 5% 1/4W
R52	1-247-700-11	CARBON 100 5% 1/4W
R53, 54	1-249-390-11	CARBON 5.6 5% 1/4W
R55	1-247-700-11	CARBON 100 5% 1/4W
R56	1-249-421-11	CARBON 2.2K 5% 1/4W
R57	1-215-394-00	METAL 75 1% 1/6W
R61	1-249-415-11	CARBON 680 5% 1/4W
R62	1-249-405-11	CARBON 100 5% 1/4W
R63, 70	1-249-429-11	CARBON 10K 5% 1/4W
R71, 72	1-247-903-00	CARBON 1M 5% 1/4W
R73	1-249-431-11	CARBON 15K 5% 1/4W
R74	1-249-437-11	CARBON 47K 5% 1/4W
R75	1-249-415-11	CARBON 680 5% 1/4W
R76	1-249-431-11	CARBON 15K 5% 1/4W
R77	1-249-437-11	CARBON 47K 5% 1/4W
R78	1-249-415-11	CARBON 680 5% 1/4W
R79	1-215-394-00	METAL 75 1% 1/6W
R90, 91	1-249-423-11	CARBON 3.3K 5% 1/4W
R92, 93	1-249-426-11	CARBON 5.6K 5% 1/4W
R94	1-249-415-11	CARBON 680 5% 1/4W
R95	1-249-417-11	CARBON 1K 5% 1/4W
R96	1-249-423-11	CARBON 3.3K 5% 1/4W
R97, 98	1-249-417-11	CARBON 1K 5% 1/4W
R99	1-249-423-11	CARBON 3.3K 5% 1/4W
R100	1-249-417-11	CARBON 1K 5% 1/4W
RV1	1-226-702-00	ADJ, METAL GLAZE 2.2K

5-2-6. PS-204 Board

Ref No.	Part No.	Description
⚠	*A-7515-051-A	COMPLETE PCB, PS-204 (UC MODEL)
	*A-7515-053-A	COMPLETE PCB, PS-204P (EK MODEL)
	1-533-037-XX	HOLDER, FUSE
	*3-701-947-12	LABEL (T1.25A), FUSE (EK MODEL)
	*3-701-948-10	LABEL (T400MA), FUSE (EK MODEL)

Ref No.	Part No.	Description			
C2, 3	1-106-220-00	FILM	0.1	10%	100V
C4	1-126-115-11	ELECT	3300	20%	80V
C5	1-124-563-11	ELECT	2200	20%	25V
C6	1-124-157-11	ELECT	33	20%	50V
C8	1-124-935-51	ELECT	470	20%	100V
C9	1-125-151-00	ELECT	47	20%	50V
C11, 12	1-124-455-00	ELECT	100	20%	16V
C13	1-131-349-00	TANTALUM	2.2	10%	35V
C14	1-126-157-11	ELECT	10	20%	16V
C15	1-161-051-00	CERAMIC	0.01	10%	25V
C16	1-124-144-00	ELECT	220	20%	16V
C17	1-161-051-00	CERAMIC	0.01	10%	25V
C18, 19	1-124-455-00	ELECT	100	20%	16V
C20	1-124-584-00	ELECT	100	20%	10V
C21	1-124-455-00	ELECT	100	20%	16V
C22	1-126-320-11	ELECT	10	20%	16V
C50	1-124-225-00	ELECT	100	20%	6.3V

Ref No.	Part No.	Description
CN1	*1-506-467-11	2P
CN2	*1-506-476-11	11P
CN3	*1-506-469-11	4P
CN5	*1-506-467-11	2P
CN6	*1-506-473-11	8P

Ref No.	Part No.	Description
D1	8-719-504-60	S4VB60
D2	8-719-981-01	ERA81-004
D3	8-719-102-51	1SZ51
D4, 5	8-719-911-19	1SS119
D6	8-719-102-51	1SZ51
D7-14	8-719-911-19	1SS119
D15	8-719-110-67	RD2.7ES-B2
D16	8-719-911-19	1SS119
D17-19	8-719-981-01	ERA81-004
D20	8-719-110-67	RD2.7ES-B2
D21-33	8-719-911-19	1SS119

Ref No.	Part No.	Description
⚠F2	1-532-741-11	FUSE, GLASS TUBE(UC MODEL)
	1-532-285-00	FUSE, TIME LAG(EK MODEL)
⚠F3	1-532-736-11	FUSE, GLASS TUBE(UC MODEL)
	1-532-066-00	FUSE, TIME LAG(EK MODEL)

Ref No.	Part No.	Description
IC1	8-759-135-80	μPC358C
IC2	8-759-981-64	LM2903DQ
IC3	8-759-135-80	μPC358C
IC4	8-759-240-11	TC4011BP
IC5	8-759-135-80	μPC358C
L1, 2	1-408-417-00	MICRO 47
Q1	8-729-140-96	2SD774-34
Q2	8-729-119-76	2SA1175-HFE
Q3	8-729-119-78	2SC2785-HFE
Q4	8-729-140-96	2SD774-34
Q5, 6	8-729-119-78	2SC2785-HFE
Q7	8-729-119-76	2SA1175-HFE
Q9, 10	8-729-119-78	2SC2785-HFE
Q11	8-729-119-76	2SA1175-HFE
Q12	8-729-119-78	2SC2785-HFE
Q13	8-729-119-76	2SA1175-HFE
Q14	8-729-113-33	2SB733-4
Q15	8-729-140-96	2SD774-34
Q16	8-729-377-13	2SA771-Y
Q17	8-729-119-76	2SA1175-HFE
Q18	8-729-377-13	2SA771-Y
Q19	8-729-119-78	2SC2785-HFE

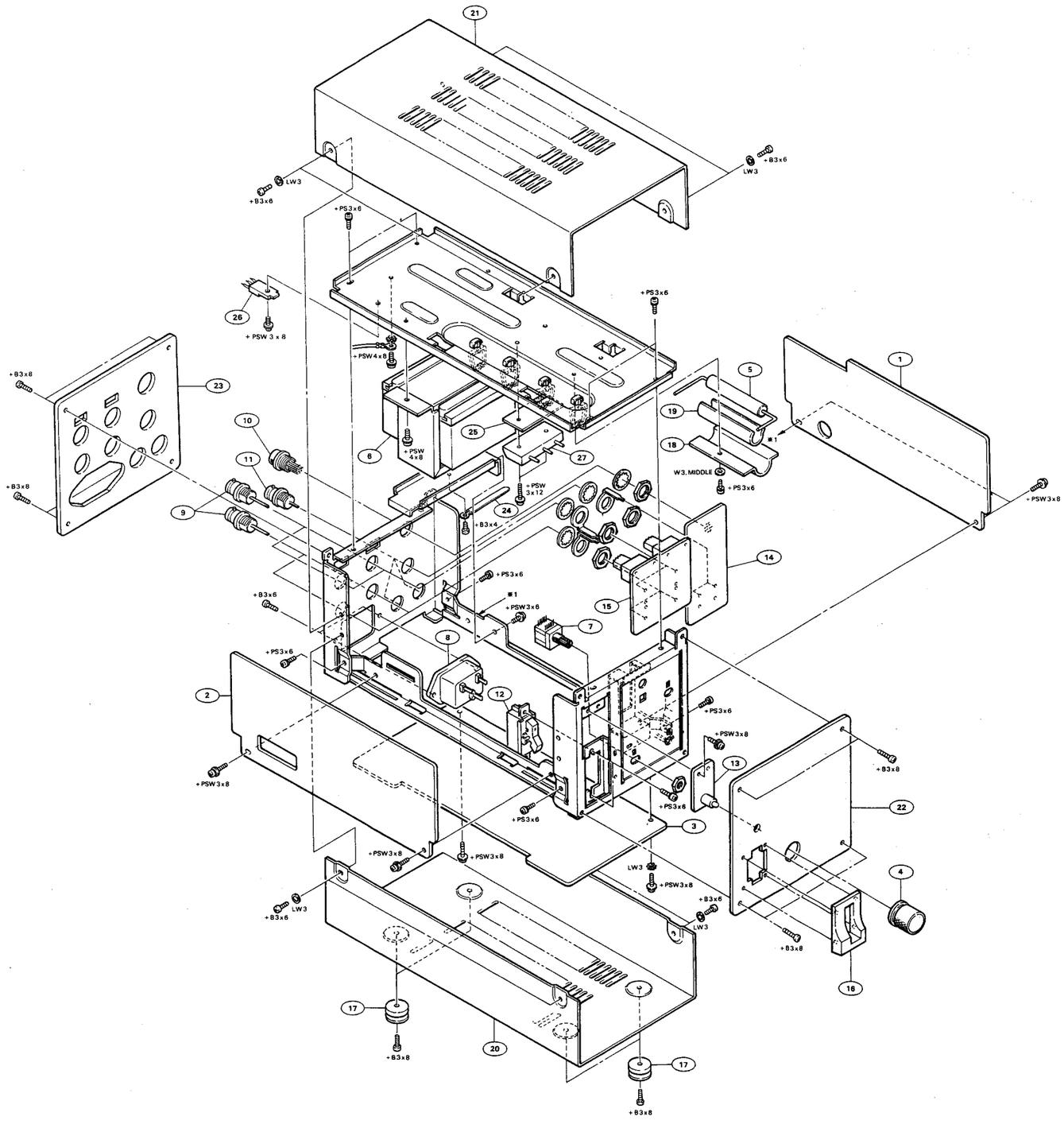
Ref No.	Part No.	Description			
R1	1-247-887-00	CARBON	220K	5%	1/4W
R2	1-249-417-11	CARBON	1K	5%	1/4W
R3	1-249-437-11	CARBON	47K	5%	1/4W
R4	1-249-433-11	CARBON	22K	5%	1/4W
R5	1-249-440-11	CARBON	82K	5%	1/4W
R6, 7	1-249-429-11	CARBON	10K	5%	1/4W
R8, 9	1-249-437-11	CARBON	47K	5%	1/4W
R10	1-249-429-11	CARBON	10K	5%	1/4W
R11	1-247-903-00	CARBON	1M	5%	1/4W
R12	1-247-900-11	CARBON	750K	5%	1/4W
R13	1-247-883-00	CARBON	150K	5%	1/4W
R15	1-249-425-11	CARBON	4.7K	5%	1/4W
R16	1-249-423-11	CARBON	3.3K	5%	1/4W
R17	1-247-854-11	CARBON	9.1K	5%	1/4W
R18	1-249-437-11	CARBON	47K	5%	1/4W

Ref No.	Part No.	Description			
R19-25	1-249-429-11	CARBON	10K	5%	1/4W
R26	1-249-407-11	CARBON	150	5%	1/4W
R27	1-249-425-11	CARBON	4.7K	5%	1/4W
R28	1-247-895-00	CARBON	470K	5%	1/4W
R29	1-249-423-11	CARBON	3.3K	5%	1/4W
R32	1-249-433-11	CARBON	22K	5%	1/4W
R33	1-249-441-11	CARBON	100K	5%	1/4W
R34	1-249-417-11	CARBON	1K	5%	1/4W
R35,36	1-249-429-11	CARBON	10K	5%	1/4W
R39	1-249-417-11	CARBON	1K	5%	1/4W
R42	1-249-429-11	CARBON	10K	5%	1/4W
R43	1-249-413-11	CARBON	470	5%	1/4W
R44	1-249-423-11	CARBON	3.3K	5%	1/4W
R45	1-249-425-11	CARBON	4.7K	5%	1/4W
R46-48	1-249-429-11	CARBON	10K	5%	1/4W
R49	1-249-427-11	CARBON	6.8K	5%	1/4W
R50	1-249-413-11	CARBON	470	5%	1/4W
R51	1-249-425-11	CARBON	4.7K	5%	1/4W
R52	1-249-413-11	CARBON	470	5%	1/4W
R53	1-249-417-11	CARBON	1K	5%	1/4W
R54	1-249-441-11	CARBON	100K	5%	1/4W
R55	1-249-433-11	CARBON	22K	5%	1/4W
R56,57	1-249-429-11	CARBON	10K	5%	1/4W
R58	1-247-764-11	CARBON	10K	5%	1/2W
R59	1-249-433-11	CARBON	22K	5%	1/4W
R60	1-249-421-11	CARBON	2.2K	5%	1/4W
R61	1-249-437-11	CARBON	47K	5%	1/4W
R62	1-249-429-11	CARBON	10K	5%	1/4W
R63	1-214-090-00	METAL	18	1%	1/4W
R65	1-249-435-11	CARBON	33K	5%	1/4W
RV1	1-226-772-11	ADJ, METAL GLAZE			4.7K
RV2	1-226-702-00	ADJ, METAL GLAZE			2.2K
RV3,4	1-226-772-11	ADJ, METAL GLAZE			4.7K

No. Part No. Description

5-3. EXPLODED VIEW

⚠1	*A-7515-049-A	COMPLETE PCB, CC-39(UC MODEL)
	*A-7515-052-A	COMPLETE PCB, CC-39P(EK MODEL)
2	*A-7515-050-A	COMPLETE PCB, MS-34
⚠3	*A-7515-051-A	COMPLETE PCB, PS-204(UC MODEL)
	*A-7515-053-A	COMPLETE PCB, PS-204P(EK MODEL)
4	X-3661-073-0	KNOB ASSY, CONTROL
⚠5	1-217-698-11	RES, WIREWOUND 75
⚠6	1-448-696-11	TRANSFORMER, POWER(EK MODEL)
	1-448-697-11	TRANSFORMER, POWER(UC MODEL)
7	1-554-955-11	SWITCH, ROTARY
⚠8	1-560-222-11	INLET 3P
9	1-561-336-00	CONNECTOR, COAXIAL
10	1-562-221-31	RECEPTACLE, CONNECTOR 12P
11	1-562-382-31	CONNECTOR, BNC
⚠12	1-570-117-11	SWITCH, SEESAW (AC POWER)
13	*1-620-377-11	LED-49 BOARD
14	*1-632-325-11	CN-395 BOARD
15	*1-632-326-11	CN-403 BOARD
16	2-251-642-00	GUARD, POWER SWITCH
17	*2-279-001-00	FOOT
18	*2-394-220-01	BRACKET, RESISTOR
19	*2-394-221-01	SHEET (R), HEAT SINK
20	*2-394-229-01	COVER, LOWER
21	*2-394-230-01	COVER, UPPER
22	2-394-233-01	PANEL, FRONT
23	2-394-234-01	PANEL, REAR
24	3-701-748-00	CLAMP
25	4-885-901-21	SHEET, RADIATION
26	8-729-231-60	2SD1406-YGR
27	8-729-303-71	2SA1493-O



No. Part No. Description

5-4. PACKING MATERIAL AND ACCESSORY

⚠1	1-551-812-00	CORD, POWER (UC MODEL)
	1-556-760-11	CORD, POWER(3 CORE) (EK MODEL)
2	*2-394-214-01	SPACER
3	*2-394-216-01	CUSHION
4	3-701-633-00	BAG, POLYETHYLENE